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SAFETY REVIEW REPORT (SRR)

TITLE: FINAL RADIOLOGICAL SURVEY REPORT OF BUILDING 064 INTERIOR

- APPROVALS -

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ABSTRACT

A comprehensive radiological survey of Building 064 and its surrounding area at the SSFL was performed in 1988. In accordance with the recommendation made in that survey report, remedial efforts were undertaken to remove residual radioactively contaminated components from the Building 064 structure and grounds. After the decontamination efforts were completed, a comprehensive final survey of the building interior was performed to demonstrate regulatory compliance for release without radiological restrictions.

Results of surveys demonstrate that Building 064 meets the requirements of DOE, NRC, and State of California for releasing Building 064 for use without radiological controls.

REFERENCES

1. 154SRR000001, Radiological Survey Plan for SSFL, Rockwell International, dated September 25, 1985, F. H. Badger and R. J. Tuttle

2. GEN-ZR-0005, Radiological Survey of the Source and Special Nuclear Material Storage Vault - Building T064, dated August 19, 1988, J. A. Chapman

3. SSWA-AN-0001, D&D Work Plan for Building 064, Environmental Restoration

4. ER-AN-0002, ETEC Environmental Restoration Program Management Plan, dated October 25, 1991

5. N001OP000033, Methods and Procedures for Radiological Monitoring

6. N001OP000028, Quality Control and General Operating Procedure for Gamma Spectroscopy Using Canberra Multichannel Analyzers

7. DOE Order 5400.5, Radiation Protection of the Public and the Environment, dated February 8, 1990

8. DECON-1, State of California Guidelines for Decontaminating Facilities and Equipment Prior to Release for Unrestricted Use, dated June 1977

9. NRC Dismantling Order for the L-85 Reactor Decommissioning, NRC to M. E. Remley, dated March 1, 1983

10. DOE/CH/8901, A Manual for Implementing Residual Radioactive Material Guidelines, T. L. Gilbert, et al., June 1989

11. MIL-STD-414, Sampling Procedures and Tables for Inspection by Variables for Percent Defective, June 11, 1957

12. N704SRR990035, Radiological Assessment of the Building T064 Fenced-In Yard, January 12, 1994

13. N704SRR990031, Final Decontamination and Radiological Survey of the Building T064 Side Yard, Rev. A, September 10, 1993

14. SSWA-AR-0002, Building 064 D&D Operations Final Report

15. SSWA-SP-0001, Building 064 Interior Final Survey Procedure (completed "on-site work copy") dated February 25, 1993

1.0 INTRODUCTION

Decontamination and decommissioning (D&D) of a number of formerly used nuclear facilities and sites is underway at Rockwell International's Santa Susana Field Laboratory (SSFL). During D&D of these facilities, reasonable efforts are being made to eliminate or to reduce residual radioactive contamination to levels that are as low as reasonably achievable (ALARA). Upon completion of D&D, radiological surveys are performed under established protocols to determine that any remaining radioactivity does not exceed applicable regulatory limits. Findings from the surveys are also used to perform additional D&D or radiological investigations, as needed. The scope of the surveys includes both known and suspected areas of contamination in the Building 064 interior.

In accordance with a broad radiological survey plan for the SSFL (Ref. 1), a comprehensive radiological survey of Building 064 and its surrounding area was performed in 1988 (Ref. 2). Results of that survey showed that the soil of the Side Yard was radioactively contaminated (which was subsequently cleaned [Ref. 13]) and that some items within the building and the ventilation exhaust filter plenums were contaminated. This report presents the final status survey results following removal of the contaminated items and the filter plenums, and removal of the floor tiles.

This report is organized as follows: first, the summary of the results of the survey and the conclusions and recommendations; second, the background information concerning past radiological status, D&D efforts, and current radiological status; third, the survey results and the technical approach used in the data collection, analyses, and limit criteria; and fourth, the supporting documentation and calculations for historical records and report completeness.

2.0 SUMMARY AND CONCLUSIONS

Survey measurements were made for surface contamination (alpha and beta) on the interior walls, floors, and ceilings in Building 064, and for ambient gamma exposure rate at 1 meter above the interior floors. These measurements were tested statistically for compliance with acceptable contamination limits for enriched uranium, activation products, and mixed fission products, and for ambient exposure rate.

All tests for surface contamination showed that the facility is suitable for release without radiological restrictions. Interpretation of the gamma exposure rate measurements for the Building 064 interior is based on the average gamma exposure rate background value (15.76 μR/hr) for a building of similar construction (Building S445) that

has never been used for any radiological purposes. The probability distributions of the comparisons between these measurements shows no local contamination, except for two measurements that were affected by the near proximity of smoke alarm units containing approximately 80 μCi Am-241. The results indicate a natural/normal background distribution for the building, with an average value of 14.7 μR/hr. Therefore, the Building 064 interior average gamma exposure rate is consistent with the average gamma exposure rate for Building S445.

3.0 BACKGROUND

3.1 Location

Building 064 is located within Rockwell International's SSFL in the Simi Hills of southeastern Ventura County, California, adjacent to the Los Angeles County line and approximately 29 miles northwest of downtown Los Angeles, directly south of the City of Simi Valley. Location of the SSFL relative to Los Angeles and vicinities is shown in Figure 1. An enlarged map of neighboring SSFL communities is shown in Figure 2. Figure 3 is a plot plan of the western portion of SSFL known as Area IV, where Building 064 is located. Building 064 is located on government-optioned land, subject to the Health and Safety Clause of the operating contract with DOE, and is exempt from licensing.

3.2 Topography and Building Characteristics

Building T064 was designed and built as a special nuclear material and source radioactive material storage building. It was constructed in two phases. The first phase was constructed in 1958. This 2137 ft^2 portion, (room 110), is a reinforced concrete structure with 11-in thick walls on a concrete slab. The building eave height is 16 ft, and the structure is open bay except for a 12 ft x 13 ft material handling area in the southeast corner of the building. A fume hood was installed in this small southeast corner, (room 104).

In 1963, the building was enlarged by adding a bay to the north (room 114) bringing the total square footage of the building to 4418 ft^2. This addition used 12-in concrete block construction with cores filled with concrete. Total square footage includes a small 150 ft^2 office (room 100) and a 50 ft^2 rest room (room 102), both located on the dock on the east side of the building. On the northwest corner is a small supply and storage room, about 50 ft^2, (room 116).

Figure 1. Location of SSFL in relation to Los Angeles and Vicinity

Figure 2. Map of Neighboring SSFL Communities

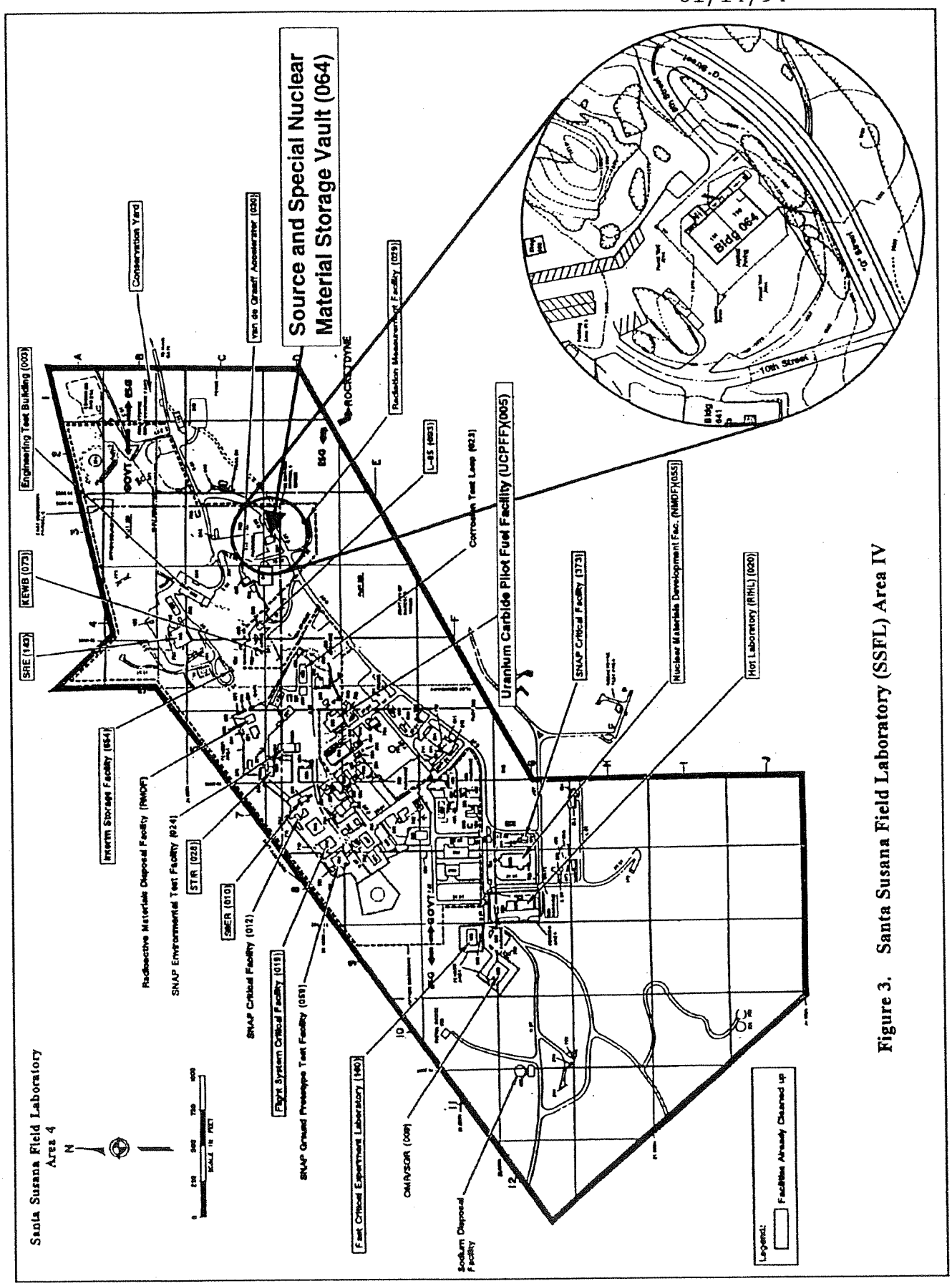

Figure 3. Santa Susana Field Laboratory (SSFL) Area IV

The concrete-slab floors were covered with 12-in square vinyl-asbestos tiles. The concrete-block walls are painted. In 1980, the entire facility was reroofed; interior wall surfaces were patched and painted; floor tile was removed and replaced; the rest room and office were restored; asphalt was patched; plumbing was repaired; heating and ventilation was repaired; and a window air-conditioner was installed in the office. Ten-ft-long fluorescent lights were suspended from the 16-ft high ceiling. Storage racks were constructed to accommodate fuel. Room 114 is accessible from the east through a 20 ft x 15 ft electrically driven rollup door and a conventional hinged door. Room 110 is accessible from the east through a heavy secured door. These two rooms are extremely secure. Ramps leading to each room allow easy transport of materials via forklift.

Since nuclear material was only stored here, there was no processing equipment within the building. No sinks were installed in the storage areas. The only water supply was to the rest room (room 102); this water was released to the sewer. The facility is not air conditioned. Each vault was ventilated by dedicated blowers through a plenum containing pre-filters and HEPA filters. Room 104 had a fume hood which exhausted through the south filter plenum.

Figure 4 is a plot plan of the building and immediate surrounding yard area. The facility sits atop a plateau about 25 ft above "G" Street and slightly above the 513 parking lot. Rock outcroppings exist upslope to the north-northeast and downslope in every other direction. Water runoff is primarily due east at the southern end of the facility. A sanitary leach field existed several years ago just north of the access road to "G" Street on the southeast section of the property. The building is surrounded by a chain link fence which is located from 20 to 30 ft from the exterior walls of the building. The area it encloses, including the building, is about 11,000 ft^2.

There are three points of access to the site location of Building T064. One access is directly from the north through the 513 parking area which is on the east side of 10th Street. A second point of access is directly off 10th Street at the NW corner of the facility, and the third is a short paved roadway connecting the SE corner of the facility with "G" Street to the east. There are two gates for accessing the fenced-in storage yard. One from the northeast corner, off of the 513 parking lot. The other from the southeast corner, off of "G" Street. Figure 5 is an aerial photo of Building T064 as viewed from the east side of the facility including the dock, office, crane, and main entrance.

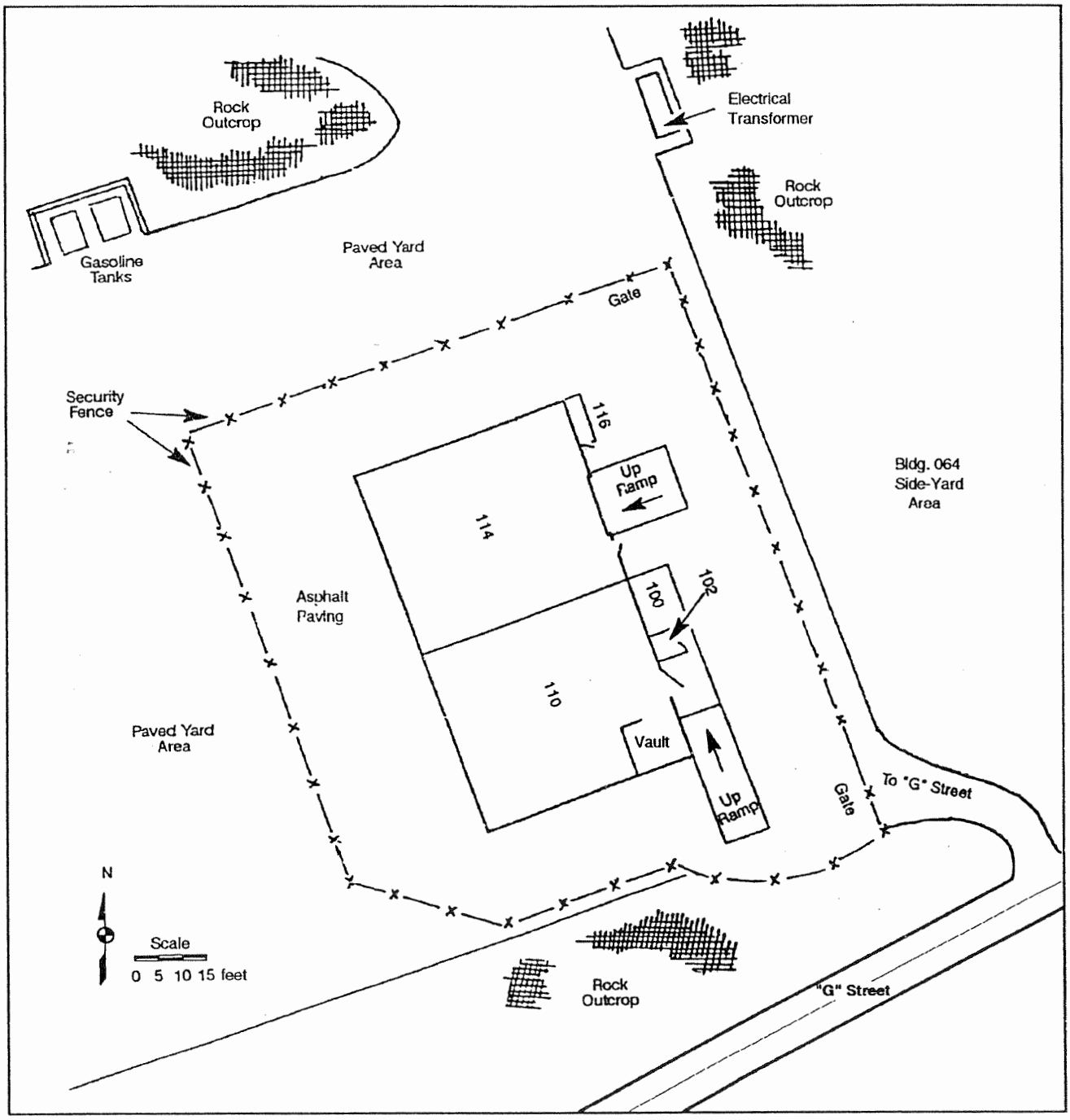

Figure 4. Building 064 Plan View

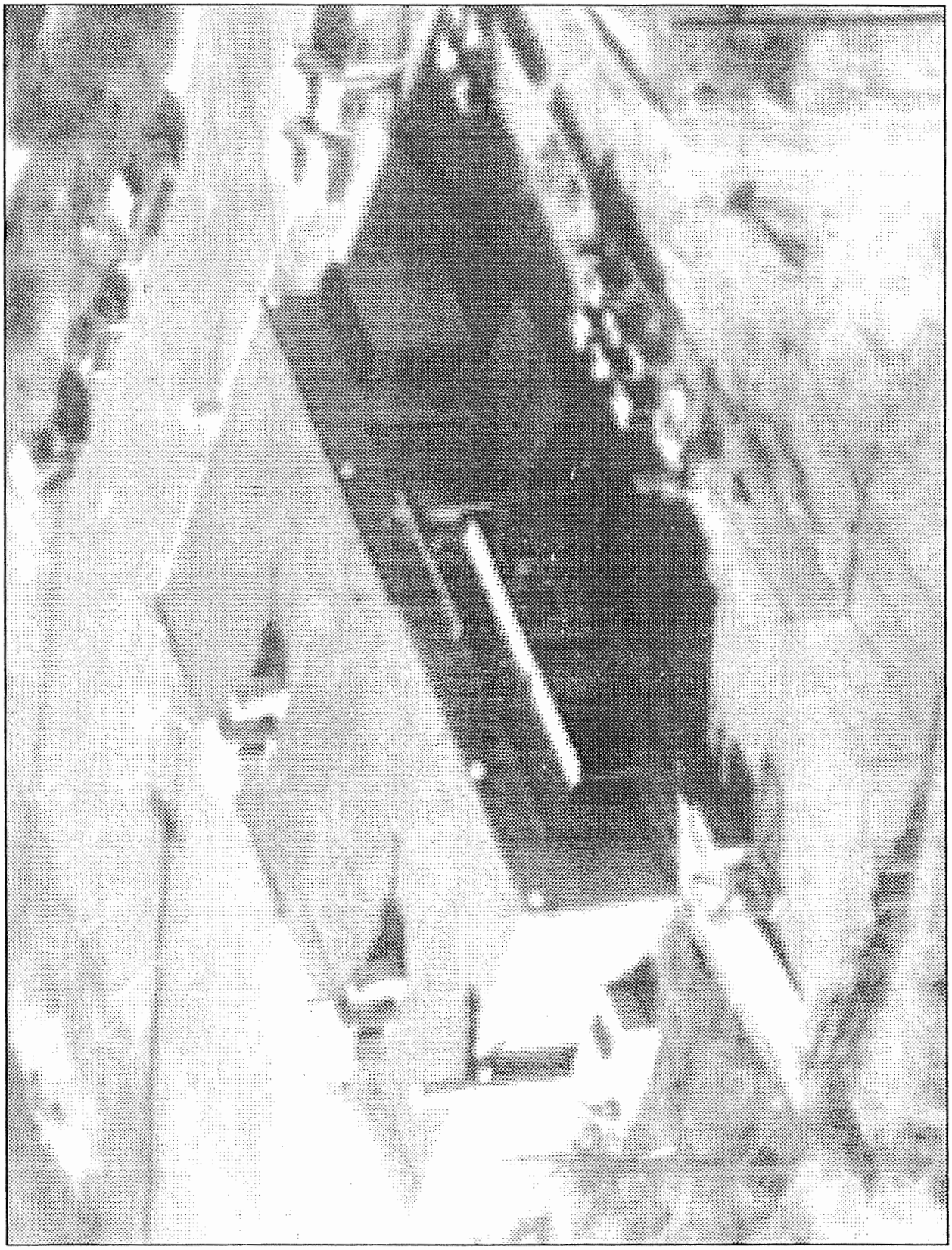

Figure 5: Aerial Photograph of Building 064, Viewing Eastside

3.3 Operating History

This building was used primarily for storage of packaged items of source material (normal uranium, depleted uranium, thorium) and special nuclear material (enriched uranium, plutonium, U-233) of various forms and configurations. Originally both the north (room 114) and the south (room 110) vaults contained steel racks for storing material. The south side was primarily used for storage of highly enriched uranium and plutonium bearing items; the north side was primarily used for source material and low enriched uranium storage.

Enriched uranium powders and source material powder packages were split into smaller units or combined into larger units in a glove box located in the small work area alcove (room 104) in the southeast corner of room 110. The glove box has since been removed from the building. Plutonium was handled only in packaged form; never in a loose form. No plutonium repackaging was done other than transferring sealed packages between containers. Transfers of solid metallic forms of material generally were handled in the glove box; however, on occasion, larger pieces were transferred and repackaged within the vault area. During shutdown and termination of the SNAP program, excess Zr-U (enriched U) alloy product line material was sectioned into lengths suitable for packaging for shipment in DOE (AEC) containers. This was done near the edge of the south side alcove in the vault. The floor was covered with plastic sheets before the Zr-U was sectioned using a common hack saw.

During the early 1960's, a changed storage configuration was required. The metal racks from the south half of room 110 was removed in order to store material in "birdcages" and drums. This storage included large quantities of special nuclear material recoverable scrap.

During this time, recoverable scrap space was at a premium. As a result, the entire yard area in front of the building (East), the side (North) and the back (West) was filled with 55 gallon drums of low enriched recoverable scrap. This material was shipped to various recovery sites in the mid-to late 1960's and early 1970's.

No plutonium or U-233 packages were ever opened in either vault. Any residual radioactive contamination is enriched uranium, normal uranium, depleted uranium, or thorium and generally could be expected to have come from "dust" from handling bare metallic pieces.

During the mid 1970's to early 1980's, most of the major DOE nuclear development and reactor contracts had ended.

No special nuclear material powders were handled or repackaged after 1980. Most of the material had been sent to other DOE sites for recovery and use. A new roof was installed on the facility in 1980 to correct leaks. Shortly afterward, the walls were repainted and other repairs were made. The racks from the north vault were removed and the area converted to storage of non-nuclear DOE components.

No reports of contamination incidents occurring within the building were recorded in the overall incident file.

3.4 Decommissioning and Demolition Efforts

To release the facility for use without radiological restrictions, all contaminated equipment and fixtures had to be removed in preparation for the final radiological survey. In addition, all hazardous materials and wastes in the facility had to be properly disposed. Where practical and cost effective, equipment was decontaminated and either disposed as non-RA waste or surplused. Some equipment required disassembly in order to remove hazardous materials such as oils, grease, and lead. Most of the items, however, could not be readily decontaminated and some equipment had areas that could not be surveyed with the confidence level necessary for release without radiological restrictions. Analysis of the floor tiles indicated that the tiles and mastic glue throughout the facility contained asbestos and would require removal and disposal.

The decommissioning work performed in room 114 consisted of the removal of miscellaneous packaged components and approximately 195 cubic yards of previously packaged containerized soil temporarily stored there. All of the items stored in room 114 were brought to the facility for storage after work with nuclear materials had ceased at B/064 and had been properly packaged to prevent release of contamination. During the removal of the equipment and boxes of soil, frequent area contamination surveys were performed by Radiation Protection and Health Physics Services (RP&HPS) representatives to assure that container integrity and contamination control were maintained. All contaminated equipment, components, and soil that had been stored in room 114 were transported to the RMDF for temporary storage awaiting eventual disposal at an approved DOE burial site.

Most of the items in room 110 had been used for operations at B/064 and were contaminated to varying degrees. When practical, size reduction and packaging were performed in the facility. However, some of the equipment required more aggressive techniques for size reduction and contamination control. These items included: a fume hood that had been

used to package enriched uranium powders and source materials, two large balances, and several steel shipping drum inserts. All of these items were transferred to the RMDF for size reduction and packaging for disposal. The fluorescent light fixtures in this room were found to be contaminated and were taken down, disassembled, and the PCB containing ballasts were removed. The fixtures (less ballasts and bulbs) were packaged and disposed of as radioactive waste. The ballasts were surveyed and found to be radiologically clean and were disposed of as hazardous PCB waste. The fluorescent bulbs were decontaminated and disposed of as conventional waste. The storage racks contained fixed RA contamination and were disassembled, size reduced, and packaged, and transferred to the RMDF for eventual shipment to an approved disposal facility.

To maintain contamination control during the size reduction of the HEPA filter plenums, size reduction was done at the RMDF. The plenums were detached from the buildings and blowers as intact units and transported to the RMDF. Because of the large size of the exhaust plenums, this effort required the fabrication of custom boxes to assure contamination control during transport. Inlet and outlet openings were sealed, the units were disconnected from the building, placed in the boxes and transferred to the RMDF. The plenums were cut into manageable pieces using a plasma torch and packaged for disposal as radioactive waste.

Because the facility had been used for storage for a number of years, special attention was given to identifying hazardous or potentially hazardous materials requiring disposition. Two scales were found to contain oil and one also contained lead. A four-ounce quantity of oil from one of the scales was determined to contain radioactive contamination and was effectively treated during the Molten Salt Oxidation (MSO) Bench Scale Unit tests being performed at the RMDF. The other oil and the lead were certified as "Containing No DOE-Added Radioactivity," in accordance with ER-SP-0001 and were disposed of in accordance with the Rocketdyne Environmental Control Manual. The ballasts removed from the light fixtures in room 110 were hermetically sealed units and after a thorough radiological survey were also certified as "Containing No DOE-Added Radioactivity" and were disposed of in accordance with the Rocketdyne Environmental Control Manual.

Because the tiles throughout the facility had been determined to contain asbestos and were in a deteriorated state their removal was required. A sampling plan was developed and implemented in accordance with ER-SP-0001. Randomly selected tiles were removed and the tiles and subfloor were surveyed for total contamination. The results of this survey sampling concluded that the tiles

and subfloor had no detectable activity (NDA) above background; therefore, all tiles were certified as "Containing No DOE-Added Radioactivity." An asbestos abatement contractor was employed to remove a total of 4,352 ft^2 of tile. The tile and abatement-related ACM wastes have been packaged and placed in an approved hazardous waste container and will be disposed at an approved disposal facility. Copies of certifications were forwarded to the DOE.

4.0 SURVEY RESULTS

4.1 Overview

Upon D&D of radioactive constituents, releasing a facility or area for unrestricted use requires a formal radiation survey to demonstrate that the applicable regulatory limits for such a release are met. The survey is performed under an established plan, and a statistical interpretation of the resulting data is made to determine if the regulatory release criteria have been met. This document provides information that demonstrates that Building 064 meets DOE, NRC, and State of California criteria for release of the facility for unrestricted use.

4.2 Scope of the Survey

For the final radiological survey of Building 064, the interior rooms and office were separated into sample lots. These sample lots are graphically shown in Figure 6. Sample lots were treated separately for the purposes of statistical data analyses. Distinguishable properties for selecting the sample lots were areas or rooms which contained contaminated components that were recently decontaminated. The chosen sample lots or areas are shown in Table 1 with the corresponding type of survey performed. (The Fenced-In Yard has been surveyed and reported [Ref. 12]. The Side Yard, to the east, has also been surveyed and reported [Ref. 13]).

Table 1. Sample Lots Surveyed

Sample Lot No.	Room or Area	Type of Survey Performed[1,3]				
		Total		Removable		Ambient Gamma[2]
		Alpha	Beta	Alpha	Beta	
1	Rooms 110 & 104	x	x	x	x	x
2	Room 114	x	x	x	x	x
3	Rooms 116, 120, & rest rooms	x	x	x	x	x

(1) The type of survey performed for each sample lot was dependent on the type of surface being measured (e.g., concrete floor, walls, asphalt, gravel roof, tile floors, etc.)

(2) Ambient gamma readings are performed only on the horizontal walking surfaces at 1 meter.

(3) 20% of all structural surfaces were surveyed in each sample lot for total alpha, total beta, removable alpha, and removable beta.

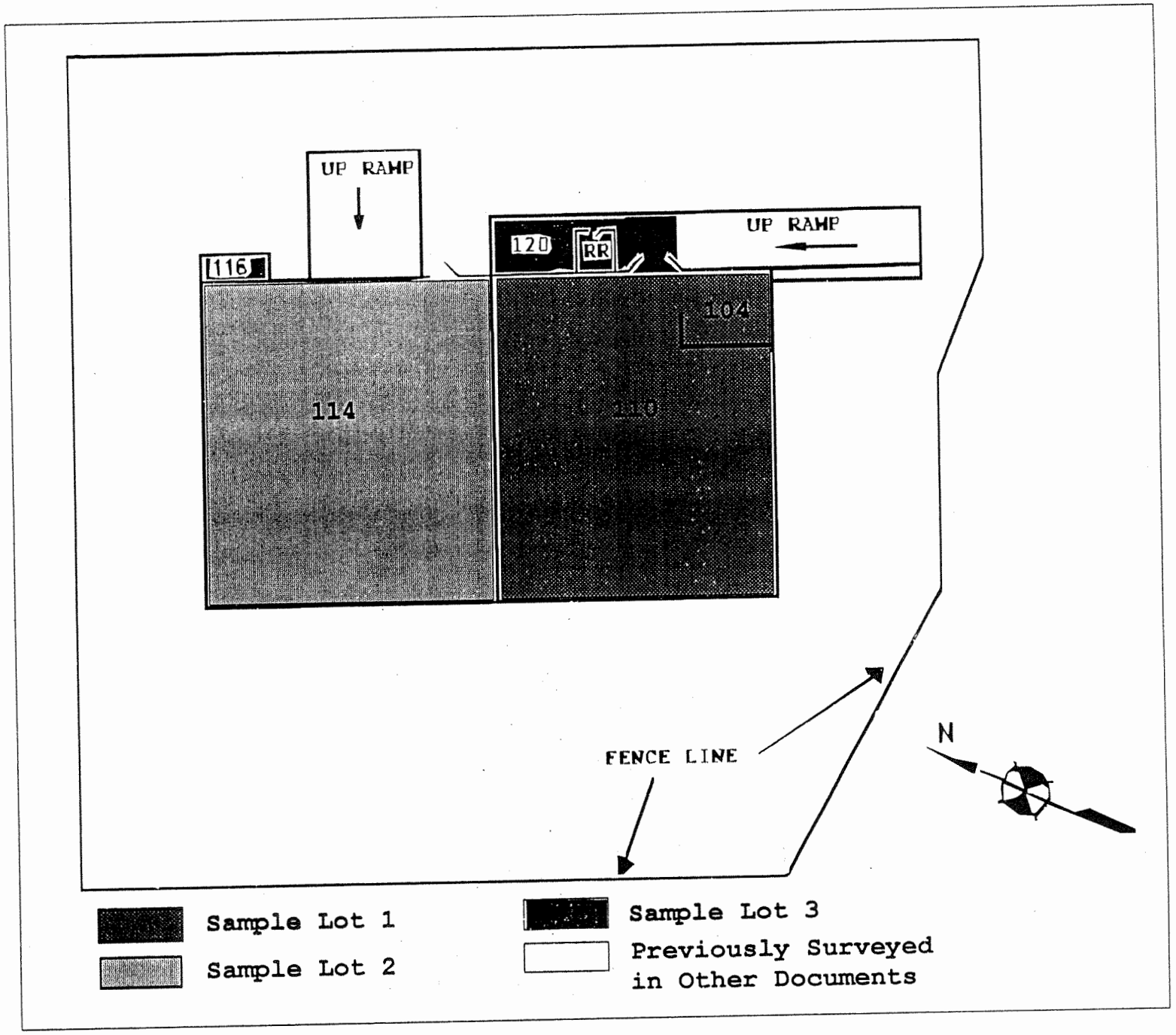

Figure 6: Building 064 Interior Sample Lot Identification

4.3 Survey Methods

The survey methods used for Building 064 interior are described in detail in Ref. 15. Maps, diagrams, and raw data for the final survey are also found in Ref. 15. Described below is a summary of those methods.

1. Sampling Method

The method and type of survey measurements depended on the type of surfaces involved. For each sample lot, a 3-meter by 3-meter grid was superimposed on the floors, walls, ceilings, or ground of the entire sample lot area. A 100% direct frisk of each 3-m by 3-m grid was then performed using a G-M pancake probe. A 1-meter by 1-meter area was then selected from each 3-m by 3-m area based on previous D&D knowledge, randomly, or indications of elevated readings from the 100% direct frisk.

Each selected 1-m by 1-m grid location was then surveyed for contamination based on the type of surface involved. This method satisfies the State of California guidelines in DECON-1 (Ref. 8) for a minimum of 10% of an area shall be surveyed, and is shown graphically in Figure 7. Walls, floors, and ceilings were surveyed for total alpha and beta activity, removable alpha and beta activity and maximum alpha and beta activity, if a "hot spot" was detected when the total alpha and beta measurements were made. Additionally, the floors were surveyed for ambient gamma exposure rate in μR/hr at 1 meter above the floor. Twenty percent of all structural surfaces (pipes, conduit, light fixtures, etc.) were surveyed for total and removable alpha and beta activity. Concrete slabs and pads were surveyed in the same manner as the interior floors. (Asphalt paving around the building was surveyed in another project and was reported in Ref. 12).

2. Instrument Calibrations and Checks

Measurements of the total and maximum alpha surface activities were made with alpha scintillation detectors, sensitive only to alpha particles with energies exceeding about 1.5 MeV. The detectors were calibrated with a Th-230 alpha source standard, traceable to NIST. A 5-min integrated count time was used.

Measurements of the total and maximum beta surface activities were made with a thin-window pancake Geiger-Mueller tube. The detectors were calibrated with a Tc-99 beta source standard, traceable to NIST. A 5-min integrated count time was used.

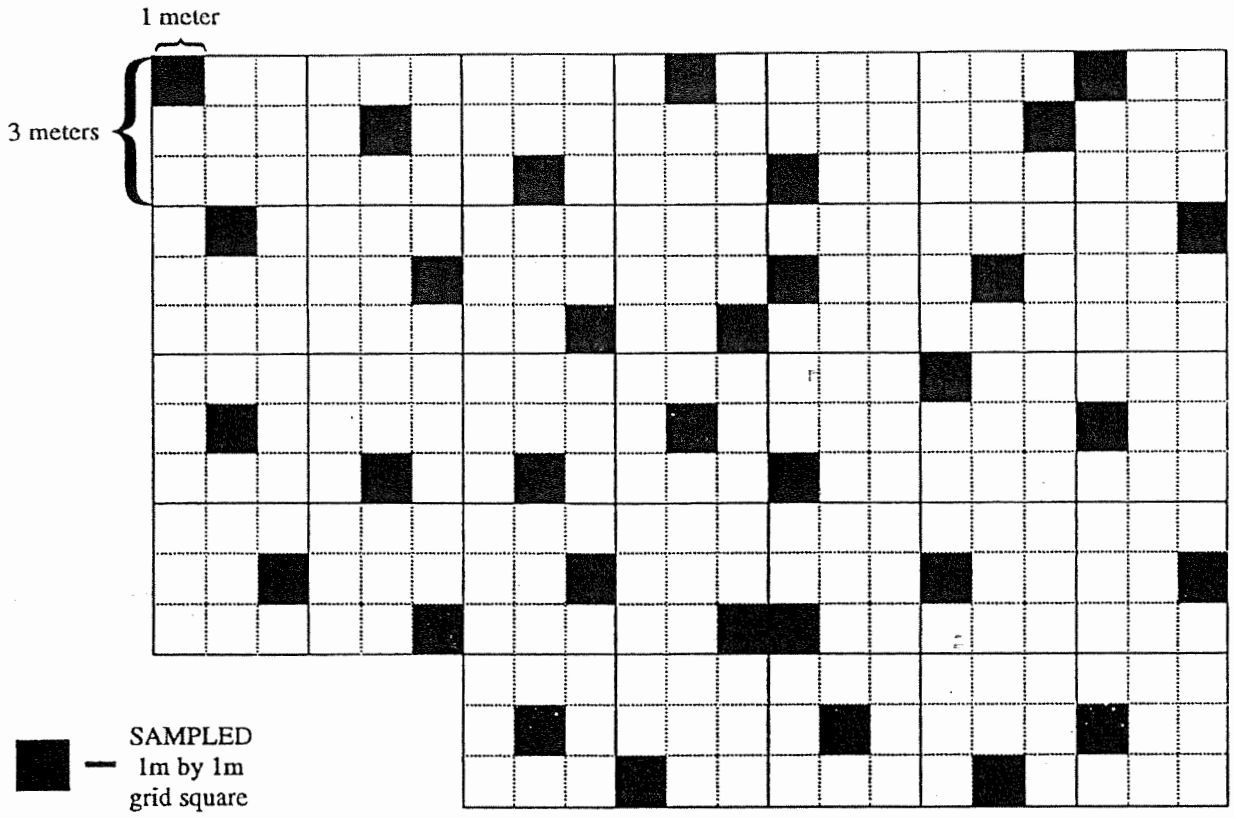

Figure 7: Typical Room or Area 3-Meter by 3-Meter Grid Markings

Measurements of removable surface activity (alpha and beta) were made by wiping approximately 100 cm^2 of surface area using standard smear disks. The activity on the disks were measured using a low-background gas-flow proportional counter. The counters were calibrated using Th-230 and Tc-99 standard sources, traceable to NIST. A 1-min integrated count time was used.

The ambient exposure rates at 1 m from surfaces were measured using a 1-in. NaI scintillation detector. These instruments were calibrated against a Reuter-Stokes high-pressure ionization chamber with natural background, and daily checks were made using a Ra-226 source, traceable to NIST, placed 1-m from the detector. A 1-min integrated count time was used.

All portable survey instruments were serviced and calibrated with NIST traceable standards on a quarterly basis. In addition, daily (when used) checks and calibrations were performed on all instrumentation to determine acceptable performance and establish a background value for the instrument on that day. Reference 5 provides further methods and procedures for environmental surveys.

Soil analyses were performed using a high purity Ge detector gamma-spectroscopy system calibrated with a NIST traceable standard. Reference 6 contains additional information concerning the entire method by which soil analyses are validated.

4.4 Technical Approach

1. Criteria and Their Implementation

Acceptable contamination limits and gamma exposure rates for releasing a facility for unrestricted use are prescribed in DOE guidelines (Ref. 7). The lowest (most conservative) limits were chosen from these guidelines and incorporated into the final survey criteria for Building 064. Two distinguishable criteria were chosen from the guidelines.

a) The surface contamination limits for alpha and beta were excerpted from DOE Order 5400.5 (Ref. 7 and State of California guidelines (Ref. 8);

b) The ambient gamma exposure rate limits at 1 m were excerpted from NRC Dismantling Order for the L-85 reactor decommissioning (Ref. 9) for conservatism and consistency with past decommissioning efforts. Although DOE Order 5400.5 (Ref. 7) recommends a value of 20 μR/hr above background, the value of 5 μR/hr from the NRC Dismantling Order (Ref. 9) was used for consistency, conservatism, and in keeping with ALARA principles.

Determination of an appropriate value for gamma exposure rate background has been a continuing problem, due to the variability of natural radiation on the site and differences between indoors and out. Reference values that have been used are 8.10 μR/hr inside a steel-walled and -roofed building with plasterboard office walls, and from 14.0 to 16.6 μR/hr in outside areas. This building does not correspond to either case, being an empty concrete structure.

To resolve this difficulty, a building with similar construction was sought for the purpose of determining a comparable radiation background. Building S445, near the entrance to SSFL and never used for nuclear or radioactive materials, was selected. This building was a concrete slab floor, cast-in-place concrete walls up to about 3 ft above grade with concrete blocks above, and a poured concrete roof. The ambient gamma exposure rate was measured, in the same manner as for a final survey, at 40 locations within Building 445, on an evenly spaced 1-m grid. A cumulative probability plot of these measurements is shown in Figure 8. This shows that the majority of values, with the exception of one anomalously low measurement, fit a Gaussian distribution very well. (The low value was measured adjacent to the steel double doors of the building, one open, the other closed.) The average of these values is 15.76 μR/hr, and the acceptance limit for gamma exposure rate in buildings of this sort is 20.76 μR/hr.

Table 2 provides a summary of the contamination limit criteria. Table 3 demonstrates that the detection limits (SSAs) for the instruments and method are well below the established limit criteria (from regulatory requirements) shown in Table 2.

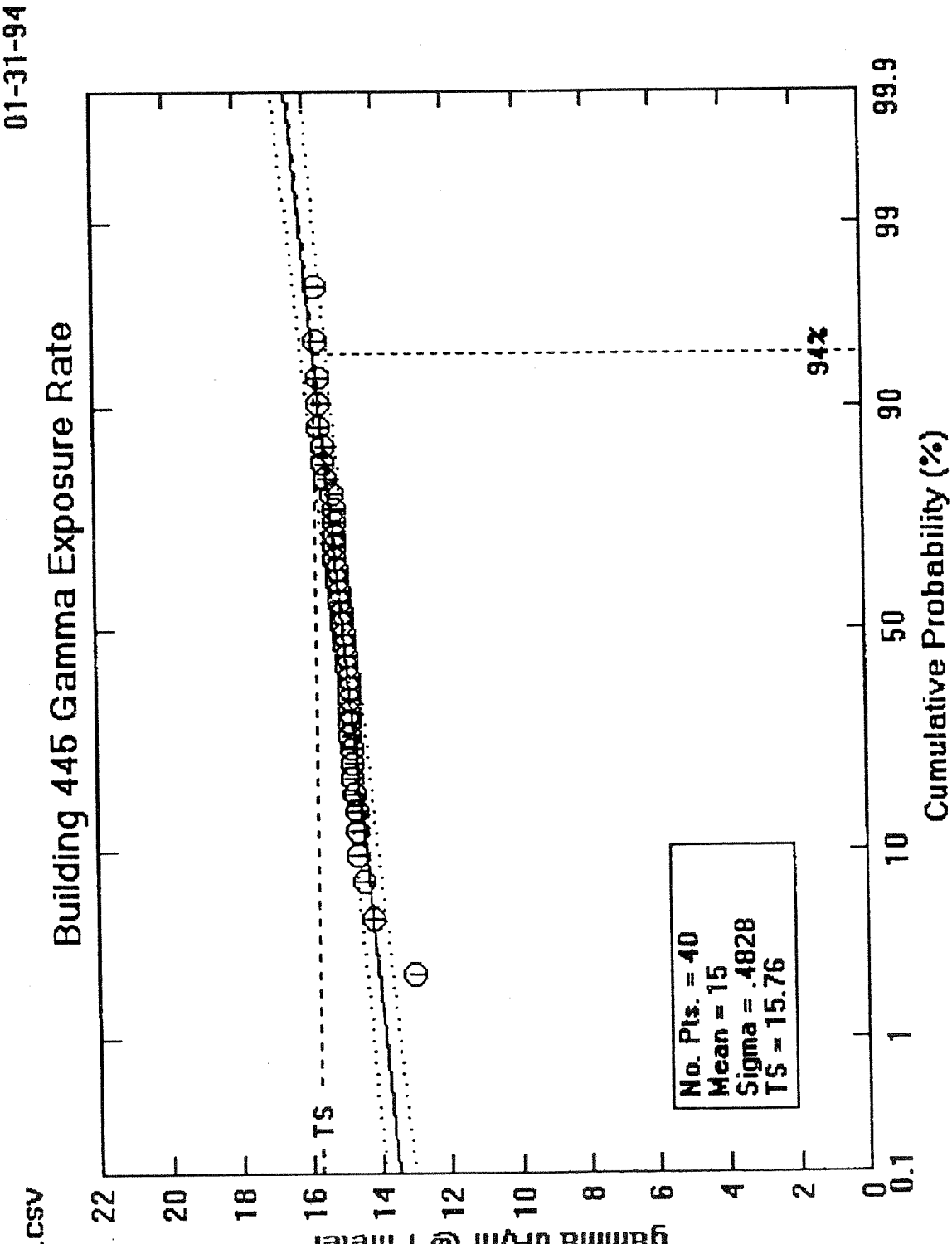

Figure 8: Gamma exposure rate measured in Bldg. 445. Concrete building (Bldg. 445) has construction similiar to that of T064 and no radiological history. Confidence bounds (95%) on least-squares fit of data are close to the derived Gaussian line. One value is anomalously low due to measurement near doorway. See Appendix B for data measurements.

Table 2. Building 064 Contamination Limit Criteria

Parameter	Limit				Reference
Allowable Total	Radionuclides[2]	Average[3,4]	Maximum[4,5]	Removable[4,6]	
Residual surface contamination for alpha and beta (dpm/100-cm^2)[1]	U-natural, U-235, U-238, & associated decay product, alpha emitters	≤5,000	≤15,000	≤1,000	8,9
Gamma exposure rate	≤5 μR/hr above background at 1 m interior				10

[1] As used in this table, dpm (disintegrations per minute) means the rate of emission by radioactive material as determined by correcting the counts per minute measured by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.

[2] Where surface contamination by both alpha- and beta-gamma-emitting radionuclides exists, the limits established for alpha- and beta-gamma-emitting radionuclides should apply independently.

[3] Measurements of average contamination should not be averaged over an area of more than 1 m^2. For objects of less surface area, the average should be derived for each such object.

[4] The average and maximum dose rates associated with surface contamination resulting from beta-gamma emitters should not exceed 0.2 mrad/h and 1.0 mrad/h, respectively, at 1 cm.

[5] The maximum contamination level applies to an area of not more than 100 cm^2.

[6] The amount of removable material per 100 cm^2 of surface area should be determined by wiping an area of that size with dry filter or soft absorbent paper, applying moderate pressure, and measuring the amount of radioactive material on the wiping with an appropriate instrument of known efficiency. When removable contamination on objects of surface area less than 100 cm^2 is determined, the activity per unit area should be based on the actual area and the entire surface should be wiped. It is not necessary to use wiping techniques to measure removable contamination levels if direct scan surveys indicate that the total residual surface contamination levels are within the limits for removable contamination.

Table 3. Observed Detection Limits versus Established Limit Criteria

	Total Alpha (dpm/100 cm^2)	Removable Alpa (dpm/100 cm^2)	Total Beta (dpm/100 cm^2)	Removable Beta (dpm/100 cm^2)	Ambient Gamma Exposure Rate (μR/hr)
Limit criteria	5000	1000	5000	1000	<5.0 above background
Average obs. detection limit (SSA*)	10	4	316	12	0.60
Obs. detection limit range	3-36	2-19	252-373	6-23	0.49-0.66
Ratio of ave-obs. detection limit to established limit criteria	0.20%	0.39%	6.32%	1.17%	12.02%

*SSA = 1.645 x SQRT (2 x counts) x area factor x efficiency factor/minutes = dpm/100 cm^2

2. Data Analyses and Statistical Criteria

A statistical procedure was used to validate the applicability of the raw survey data for selected sample lots or areas. The statistical method known as "sampling inspection by variables" (Ref. 11) was used. This method has been widely applied in industry and the military and is essential where the lot size is impractically large. In the case of determining residual contamination in Building 064, it would be unacceptably time consuming and not cost effective to measure and document 100% of the building. However, by applying sampling inspection by variables methods, acceptable confidence in the conclusion made about the level of contamination can be achieved.

In sampling inspection by variables, the number of data points on which measurements are obtained is first chosen to be large so that the parameters of the distribution are likely to have a normal distribution (i.e., Gaussian). The mean of the distribution, $\bar{x}$, and its standard deviation, s, are then related to a "test statistic," TS, as follows:

$$TS = \bar{x} + ks$$

where $\bar{x}$ = average (arithmetic mean of measured values)

s = observed sample standard deviation

k = tolerance factor calculated from the number of samples to achieve the desired sensitivity for the test

UL = acceptance limit

TS and $\bar{x}$ are then compared with an acceptance limit, UL (such as those shown in Table 2), to determine acceptance or other plans of action, including rejection of the area as contaminated and requiring further remediation.

The sample mean, standard deviation, and acceptance limit are easily calculable quantities; the value of k, the tolerance factor, bears further discussion. Of the various criteria for selecting plans for acceptance sampling by variables, the most appropriate is the method of Lot Tolerance Percent Defective (LTPD), also referred to as the Rejectable Quality Level (RQL). The LTPD is defined as the poorest quality that should be accepted in an individual lot. Associated with the LTPD is a parameter referred to as consumer's risk (β), the

risk of accepting a lot of quality equal to the LTPD. USNRC Regulatory Guide 6.6 ("Acceptance Sampling Procedures for Exempted and Generally Licensed Items Containing By-Product Material") states that the value for the consumer's risk should be 0.10. Conventionally, the value assigned to the LTPD has been 10%.

The State of California has stated that the consumer's risk of acceptance (β) at 10% defective (LTPD) must be 0.1. For those choices of β and LTPD, $K_\beta = K_2 = 1.282$. The number of samples is n. Values of k for each sample size are calculated in accordance with the following equations:

$$K = \frac{K_2 + \sqrt{K_2^2 - ab}}{a}; \quad a = 1 - \frac{K_\beta^2}{2\,(n-1)}; \quad b = K_2^2 - \frac{K_\beta^2}{n} \quad (Eq.1)$$

where k = tolerance factor

K_2 = the normal deviate exceeded with probability of β, 0.10 (from tables, K = 1.282)[1]

K_β = the normal deviate exceeded with probability equal to the LTPD, 10% (from tables, K = 1.282)[1]

n = number of samples

The statistical criteria for acceptance of the Building 064 interior final survey are presented below.

a) Acceptance: If the test statistic ($\bar{x}$ + ks) is less than or equal to the limit (UL), accept the region as clean. (If any single measured value exceeds 80% of the limit, decontaminate that location to as near background as is possible, but do not change the value in the analysis.) See Figure 9 for an example of the sample lot acceptance by the test.

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[1]The values chosen for these coefficients for the survey correspond to assuring, with 90% confidence, that 90% of the area has residual contamination below 100% of the applicable limit (a 90/90/100 test). The choice of values for the two coefficients is consistent with industrial sampling practices and State of California guidelines (Ref. 8).

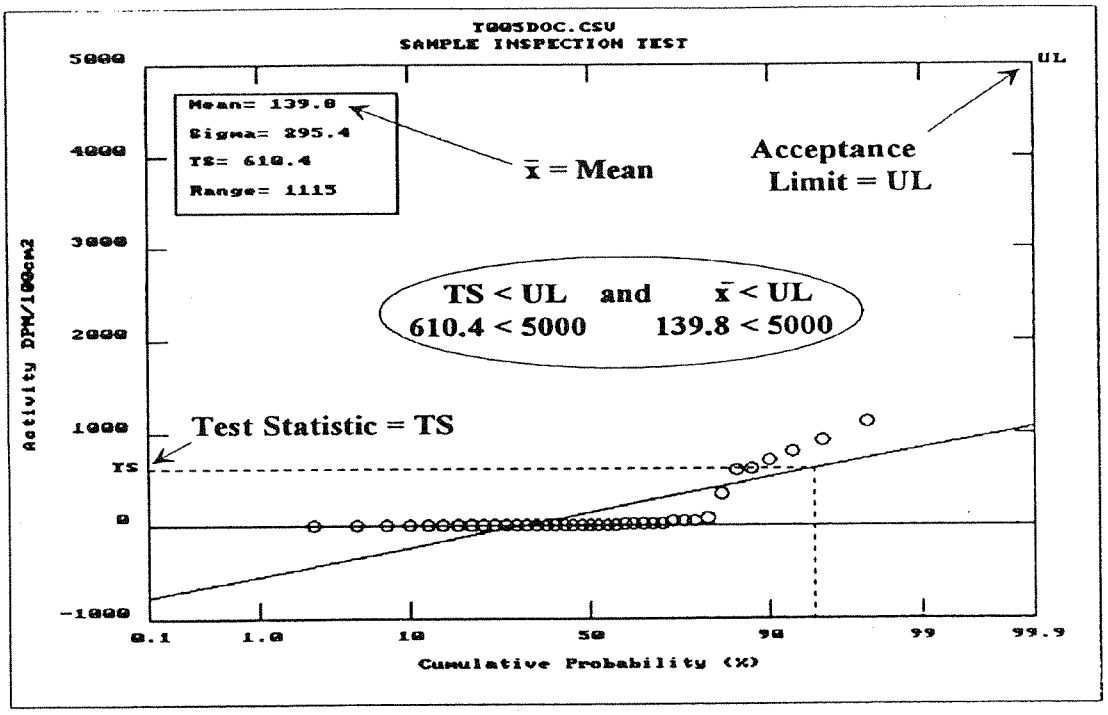


Figure 9. Example of Sample Lot Acceptance, where TS(=$\bar{x}$+ks) ≤ UL and $\bar{x}$ ≤ UL

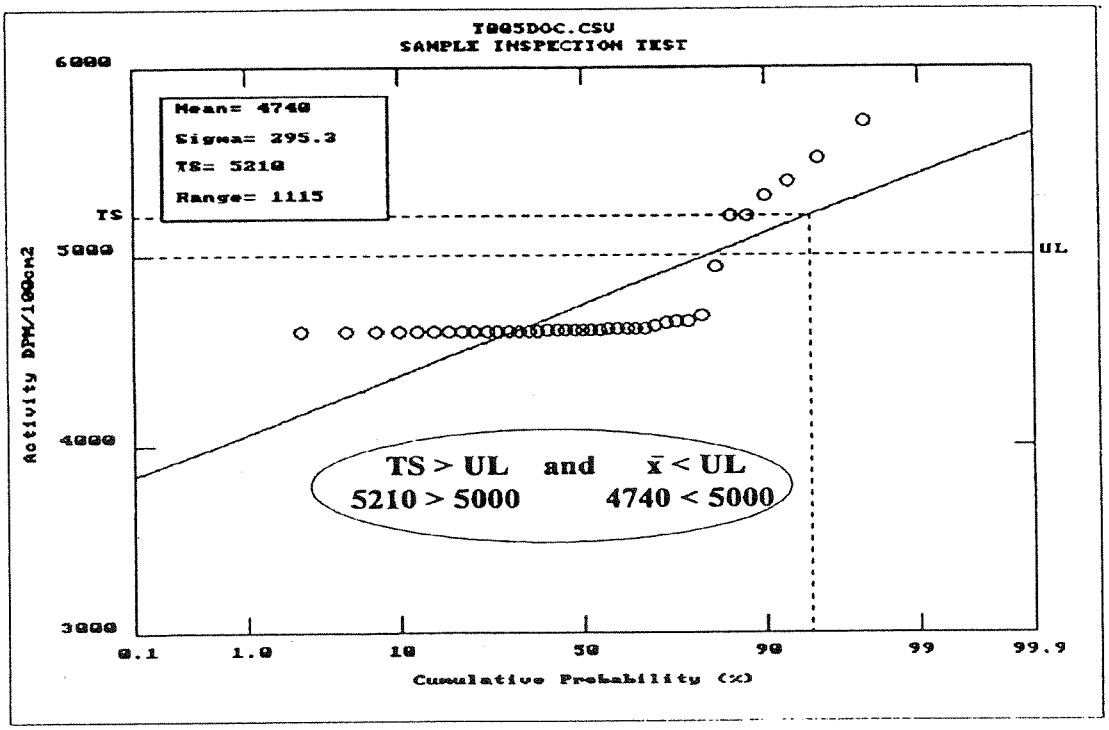


Figure 10. Example of Sample Lot Requiring Additional Measurements, where TS(=$\bar{x}$+ks) > UL and $\bar{x}$ < UL

b) Collect additional measurements: If the test statistic ($\bar{x}$ + ks) is greater that the limit (UL), but $\bar{x}$ itself is less than UL, independently resample and combine all measured values to determine if $\bar{x}$ + ks $\leq$ = UL for the combined set; if so, accept the region as clean. If not, the region is contaminated and must be remediated. See Figure 10 for an example of additional measurements that must be taken in the sample lot to accept or reject it.

c) Rejection: If the test statistic ($\bar{x}$ + ks) is greater than the limit (UL) and $\bar{x}$ > = UL, the region is contaminated and must be remediated. See Figure 11 for an example of sample lot rejection by the test.

Thus, based on sampling inspection, we are willing to accept the hypothesis that the probability of accepting a lot as not being contaminated which is, in fact, 10% defective is 0.10. Or in other words, the Building 064 final survey corresponds to assuring with 90% confidence that 90% of the area has residual contamination below 100% (a 90/90/100 test) of the applicable limits described in Table 2.

4.5 Sample Lot Analyses and Results

1. Sample Lot 1

a) Description

Sample Lot 1 consists of room 110 and the southern section of the building, and room 114, where the fume hood had been installed.

b) Analyses of Sample Lot 1 Data

Raw data measurements for Sample Lot 1 were taken, subtracted for daily instrument background (except for ambient gamma exposure rates) and plotted on a cumulative probability graph as explained previously. For statistical comparisons (using the "sampling inspection by variables" method), similar areas within Sample Lot 1 were combined together and then analyzed for the specific type of radiation measurement made on the surface. Individual raw measurement data and instrument backgrounds are provided in Appendix A.

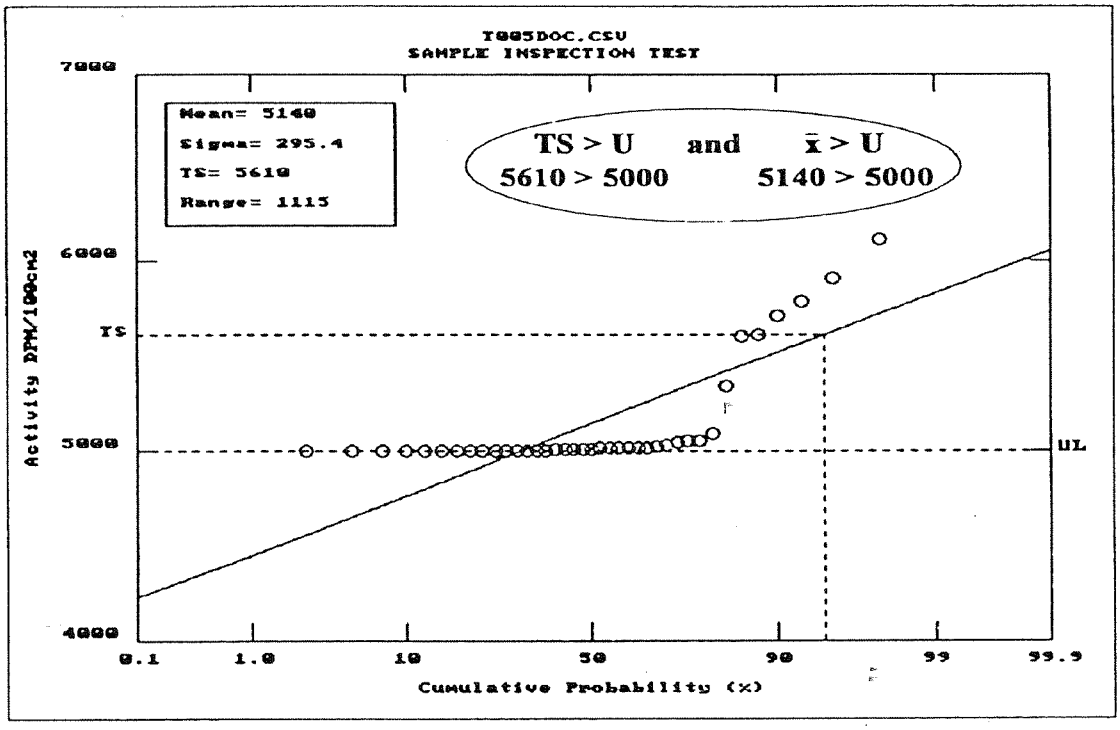


Figure 11. Example of Sample Lot Rejection, where TS(=$\bar{x}$+ks) > UL and $\bar{x}$ > UL

Table 4. Sample Lot 1 Results

	Calculated Test Statistic (TS = $\bar{x}$ + ks)				
	Total		Removable		Gamma Exposure Rate (μR/hr @ 1 m)
	Alpha (dpm/100 cm^2)	Beta (dpm/100 cm^2)	Alpha (dpm/100 cm^2)	Beta (dpm/100 cm^2)	
Acceptance Limit (UL)	5000	5000	1000	1000	20.76**
Floors only					16.25 (16)*
Entire area - floors, walls, ceiling, & structure	74.77 (12)*	863.5 (14)*	6.29 (13)*	12.98 (15)*	

* Numbers in parenthesis refer to figure numbers.

** The acceptance limit for ambient gamma exposure rate in μR/hr was determined by calculating the average ambient indoor background (15.76 μR/hr) from 40 locations inside a known uncontaminated building (Bldg. S445) and adding the acceptance criteria from Table 2 (<5 μR/hr above background) to achieve a final indoor ambient gamma exposure rate limit of 20.76 μR/hr. All values, excluding the ambient gamma exposure rate, in this table are subtracted for daily instrument background.

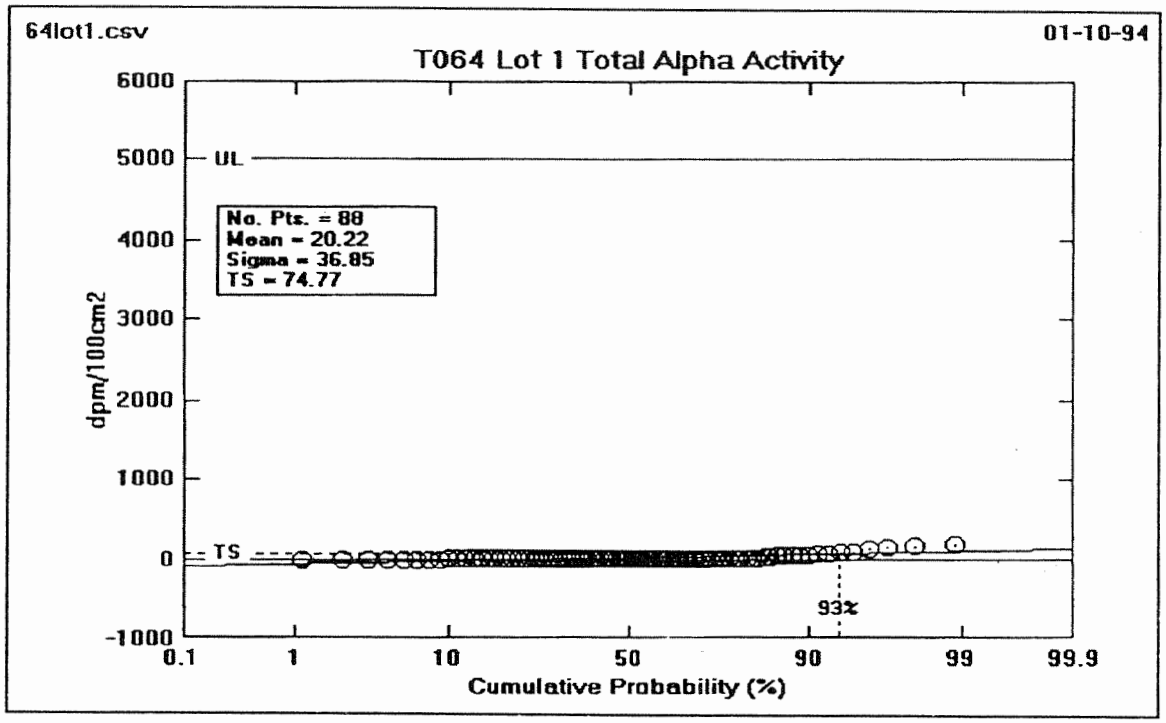
Sample lot results are summarized in Table 4 for comparing the test statistic (TS = $\bar{x}$ + ks) with applicable, established contamination criteria or acceptance limit (UL) from Table 2. The corresponding figures for the graphs of each calculated cumulative probability plot are also provided. Individual sample results used as graph data for Sample Lot 1 are provided in Appendix B.

Initial review of the gamma exposure rate data, by use of the cumulative probability plot, showed an apparent discrepant value of 17.54 μR/hr at floor grid location 5,12. On investigation, it was found that a wall-mounted smoke alarm unit was approximately 1 meter away from the gamma detector during the measurement.

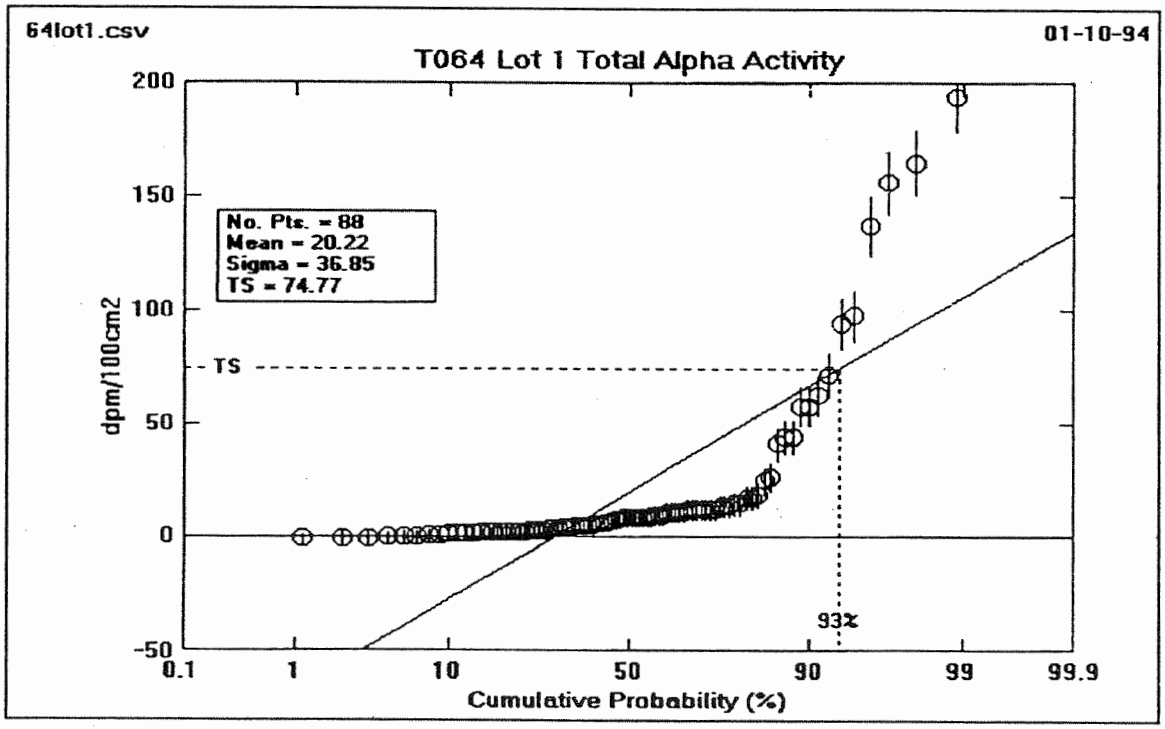
The radioactive source contained in this unit produces an estimated exposure rate of 2.79 μR/hr at the detector location. In the statistical interpretation of the Lot 1 data, this measurement has been reduced from 17.54 to 14.75 μR/hr to correct for this effect. The uncorrected value is listed in the appendix of survey results. (A similar smoke alarm unit is mounted on the wall of room 114 [Lot 2] but no adjacent measurements were made and so no corrections were required. An additional 6 units were mounted on each of the ceilings of rooms 110 and 114 and one unit in room 116, but increase the ambient exposure rate by only about 0.5 μR/hr.)

c) Interpretation of Results for Sample Lot 1

Figures 12 through 16 and Table 4 demonstrate that for each applicable acceptance limit (UL) from Table 2, the corresponding test statistic (TS) value is less than the UL or TS <UL. Therefore, the nine figures for Sample Lot 1 pass the "sampling inspection by variables" test and are "Accepted" as radiologically clean. Or in other words, the Building 064 Sample Lot 1 survey corresponds to assuring with a 90% confidence that 90% of Sample Lot 1 has residual contamination below 100% (a 90/90/100 test) of the applicable NRC, DOE, and State of California limits described in Table 2.

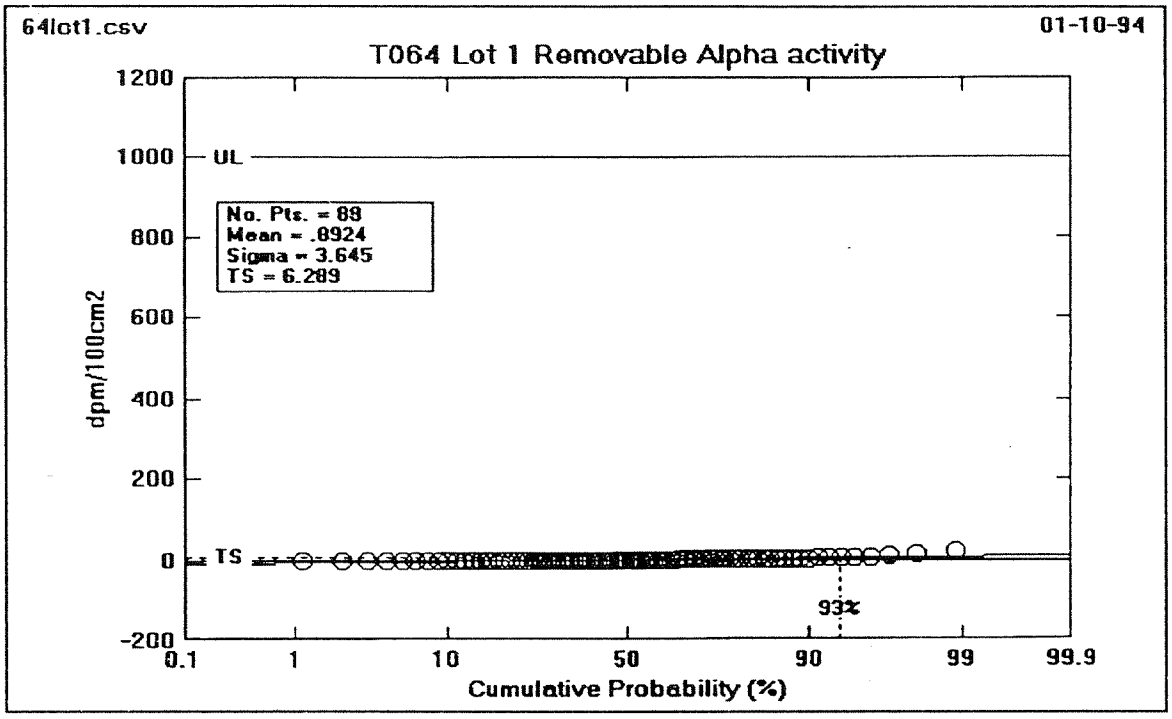


12a.) Scale including Acceptance Limit (UL)

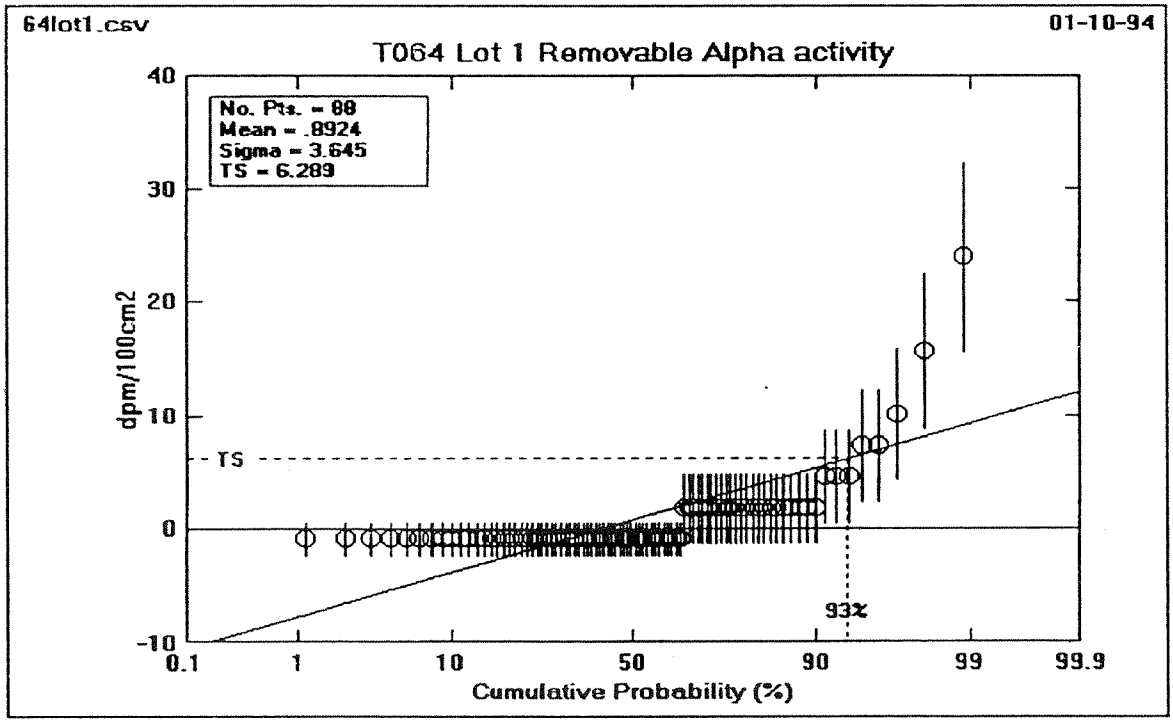


12b.) Expanded Scale

Figure 12: T064 - LOT 1 Total Alpha Activity

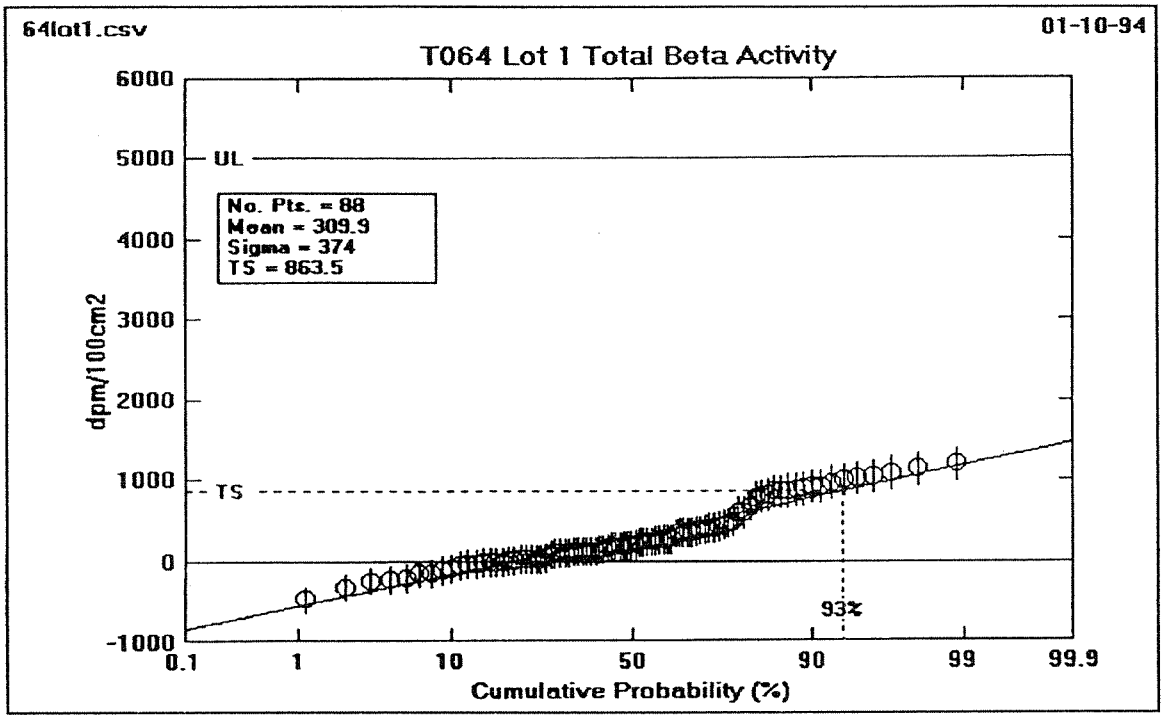


13a.) Scale including Acceptance Limit (UL)

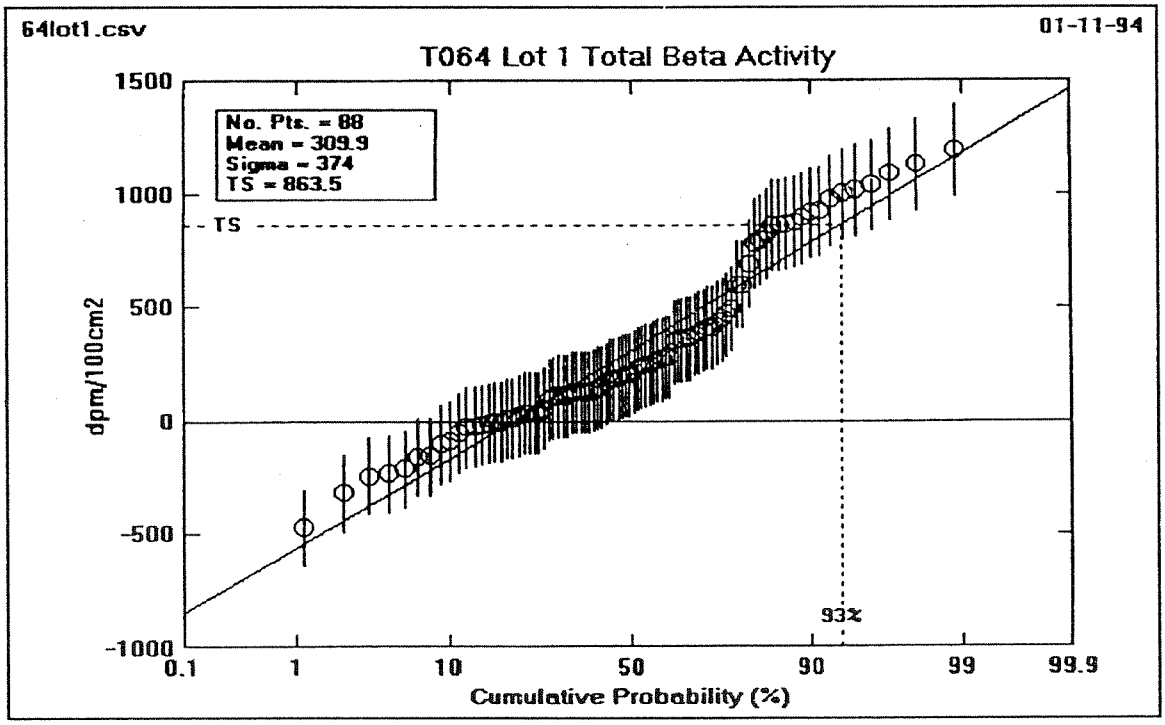


13b.) Expanded Scale

Figure 13: T064 - LOT 1 Removable Alpha Activity

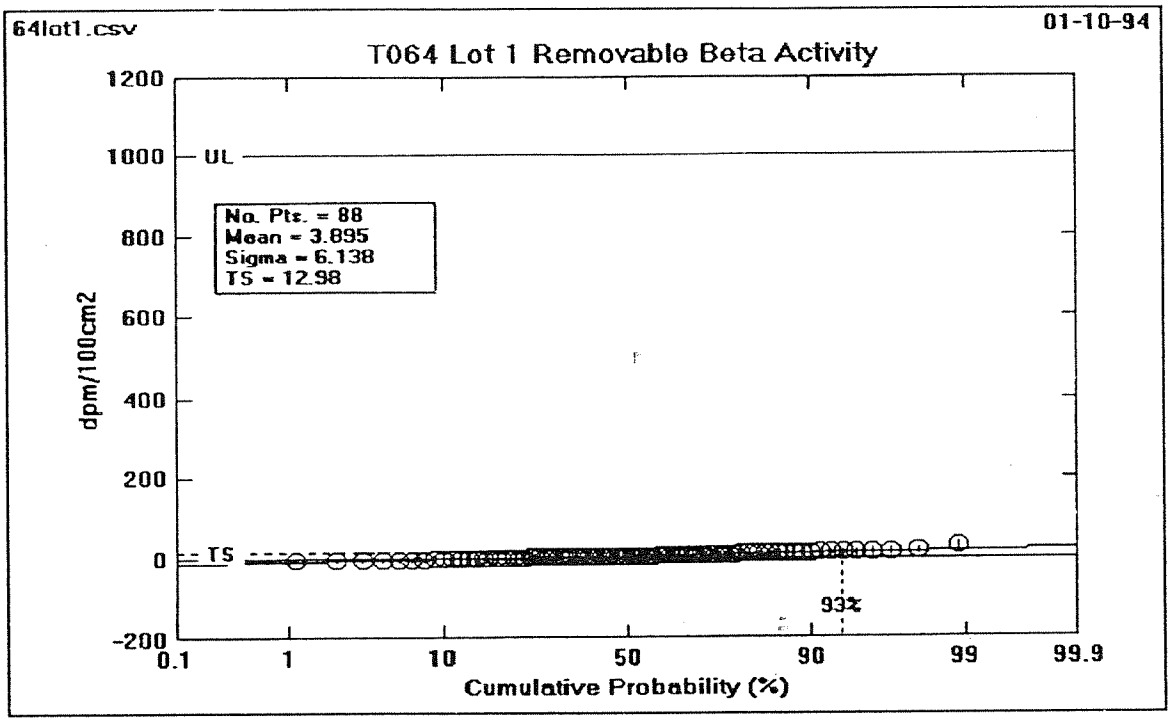


14a.) Scale including Acceptance Limit (UL)

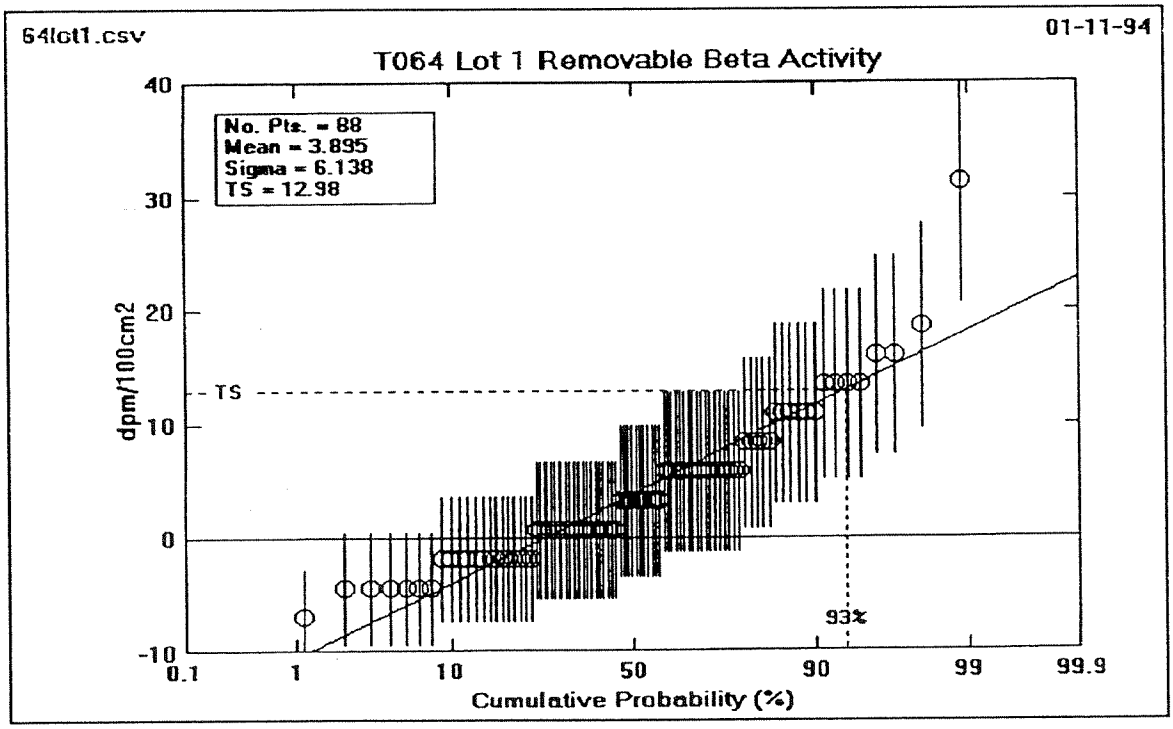


14b.) Expanded Scale

Figure 14: T064 - LOT 1 Total Beta Activity

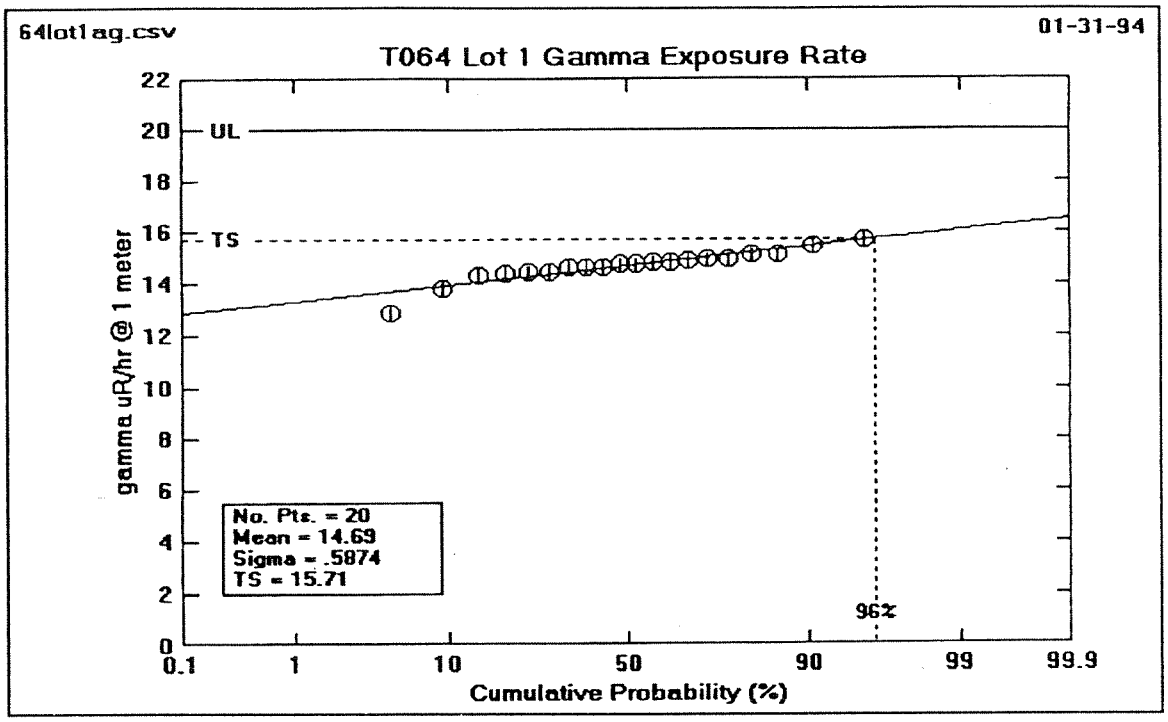


15a.) Scale including Acceptance Limit (UL)



15b.) Expanded Scale

Figure 15: T064 - LOT 1 Removable Beta Activity



16) Scale including Acceptance Limit (UL)

Figure 16: T064 - LOT 1 Floors Ambient Gamma Exposure Rate

2. Sample Lot 2

a) Description

Sample Lot 2 consists of room 114, the northern section of the building.

b) Analyses of Sample Lot 2 Data

Raw data measurements for Sample Lot 2 were taken, subtracted for daily instrument background (except for ambient gamma exposure rates) and plotted on a cumulative probability graph as explained previously. For statistical comparisons (using the "sampling inspection by variables" method), similar areas within Sample Lot 2 were combined together and then analyzed for the specific type of radiation measurement made on the surface. Individual raw measurement data and instrument backgrounds are provided in Appendix A. (The "total beta" measurements for two wall grid locations in room 110 were lost, and were replaced by measurements made in January 1994 to provide a complete set of data.)

Sample lot results are tabulated in Table 5 for comparing the test statistic ($TS = \bar{x} + ks$) with applicable, established contamination criteria or acceptance limit (UL) from Table 2. The corresponding figures for the graphs of each calculated cumulative probability plot are also provided. Individual sample results used as graph data for Sample Lot 2 are provided in Appendix B.

Table 5. Sample Lot 2 Results

	Calculated Test Statistic (TS = $\bar{x}$ + ks)				
	Total		Removable		Gamma Exposure Rate (μR/hr @ 1 m)
	Alpha (dpm/100 cm^2)	Beta (dpm/100 cm^2)	Alpha (dpm/100 cm^2)	Beta (dpm/100 cm^2)	
Acceptance Limit (UL)	5000	5000	1000	1000	20.76**
Floors only					16.0 (21)*
Entire area - floors, walls, ceiling, & structure	5.51 (17)*	938.7 (19)*	1.033 (18)*	9.067 (20)*	

* Numbers in parenthesis refer to figure numbers.

** The acceptance limit for ambient gamma exposure rate in μR/hr was determined by calculating the average ambient indoor background (15.76 μR/hr) from 40 locations inside a known uncontaminated building (Bldg. S445) and adding the acceptance criteria from Table 2 (<5 μR/hr above background) to achieve a final indoor ambient gamma exposure rate limit of 20.76 μR/hr. All values, excluding the ambient gamma exposure rate, in this table are subtracted for daily instrument background.

c) Interpretation of Results for Sample Lot 2

Figures 17 through 21 and Table 4 demonstrate that for each applicable acceptance limit (UL) from Table 2, the corresponding test statistic (TS) value is less than the UL or TS <UL. Therefore, the nine figures for Sample Lot 2 pass the "sampling inspection by variables" test and are "Accepted" as radiologically clean. Or in other words, the Building 064 Sample Lot 2 survey corresponds to assuring with a 90% confidence that 90% of Sample Lot 2 has residual contamination below 100% (a 90/90/100 test) of the applicable NRC, DOE, and State of California limits described in Table 2.

3. Sample Lot 3

a) Description

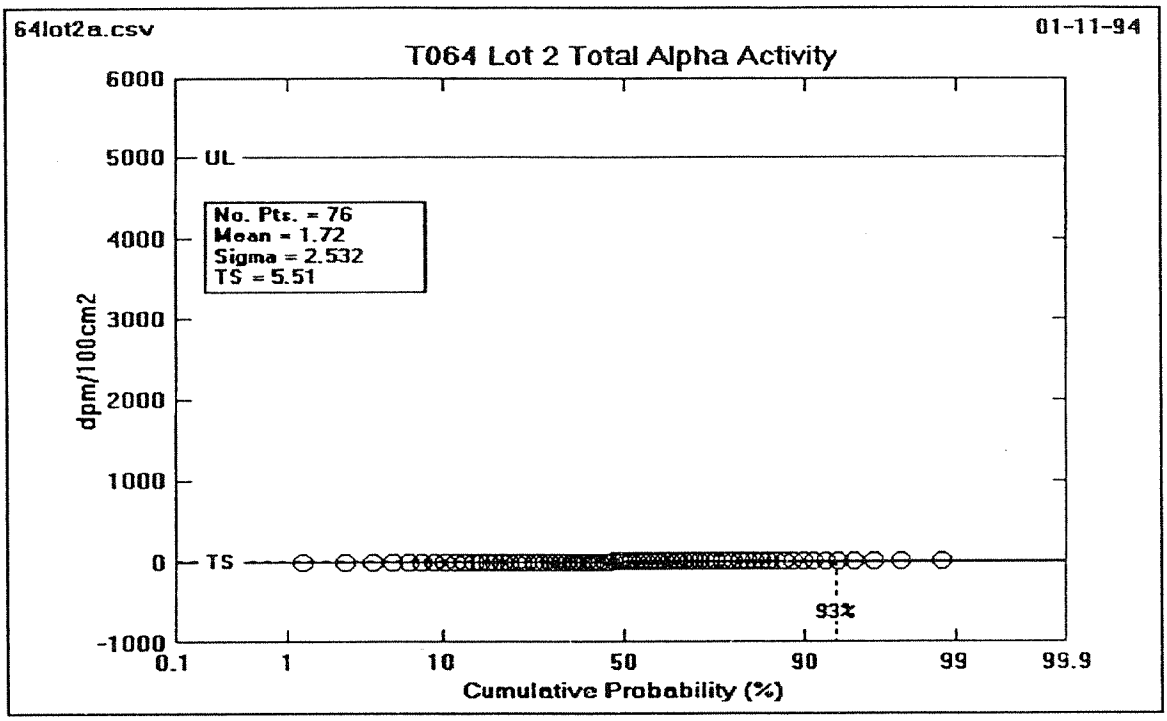
Sample Lot 3 consists of the office (room 120) and rest room, and the storage closet, room 116.

b) Analyses of Sample Lot 3 Data

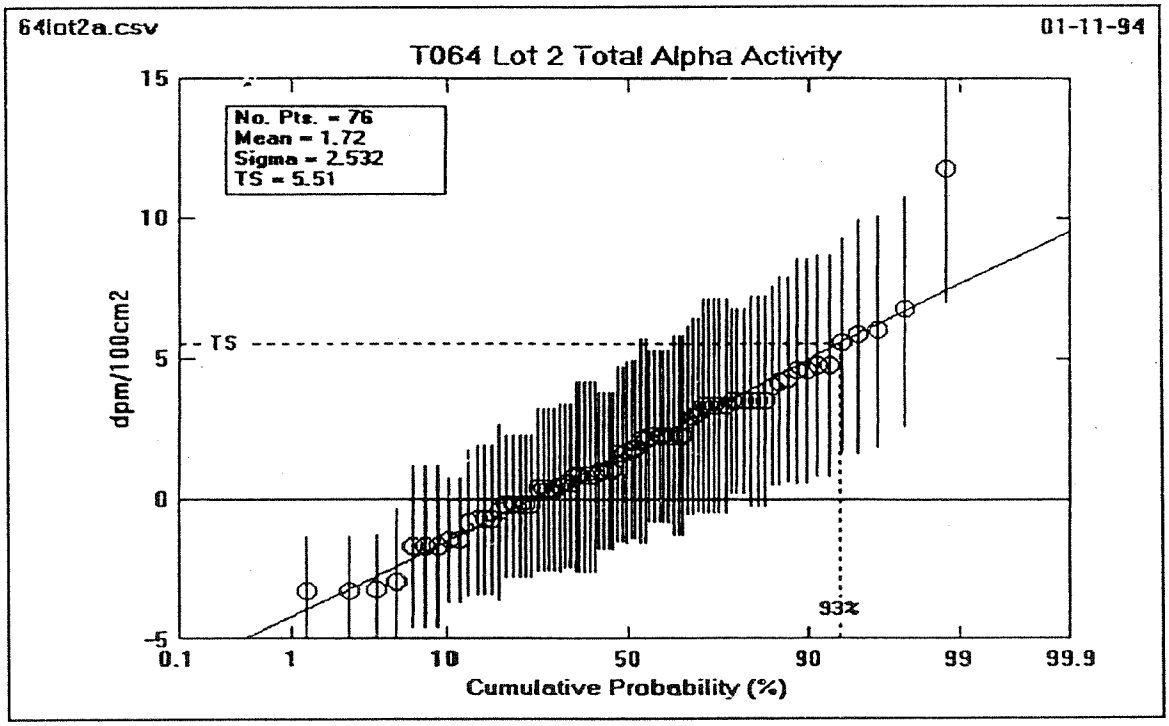
Raw data measurements for Sample Lot 3 were taken, subtracted for daily instrument background (except for ambient gamma exposure rates) and plotted on a cumulative probability graph as explained previously. For statistical comparisons (using the "sampling inspection by variables" method), similar areas within Sample Lot 3 were combined together and then analyzed for the specific type of radiation measurement made on the surface. Individual raw measurement data and instrument backgrounds are provided in Appendix A.

Sample lot results are tabulated in Table 6 for comparing the test statistic ($TS = \bar{x} + ks$) with applicable, established contamination criteria or acceptance limit (UL) from Table 2. The corresponding figures for the graphs of each calculated cumulative probability plot are also provided. Individual sample results used as graph data for Sample Lot 3 are provided in Appendix B.

This lot also showed an outlier in the gamma exposure rate data. As in Lot 1, this elevated value was due to the close proximity of a smoke alarm unit. The measured value, 17.32 μR/hr, was reduced by 2.79 μR/hr to 14.53 μR/hr for statistical interpretation. The original measured value has been left in the tabulational results.

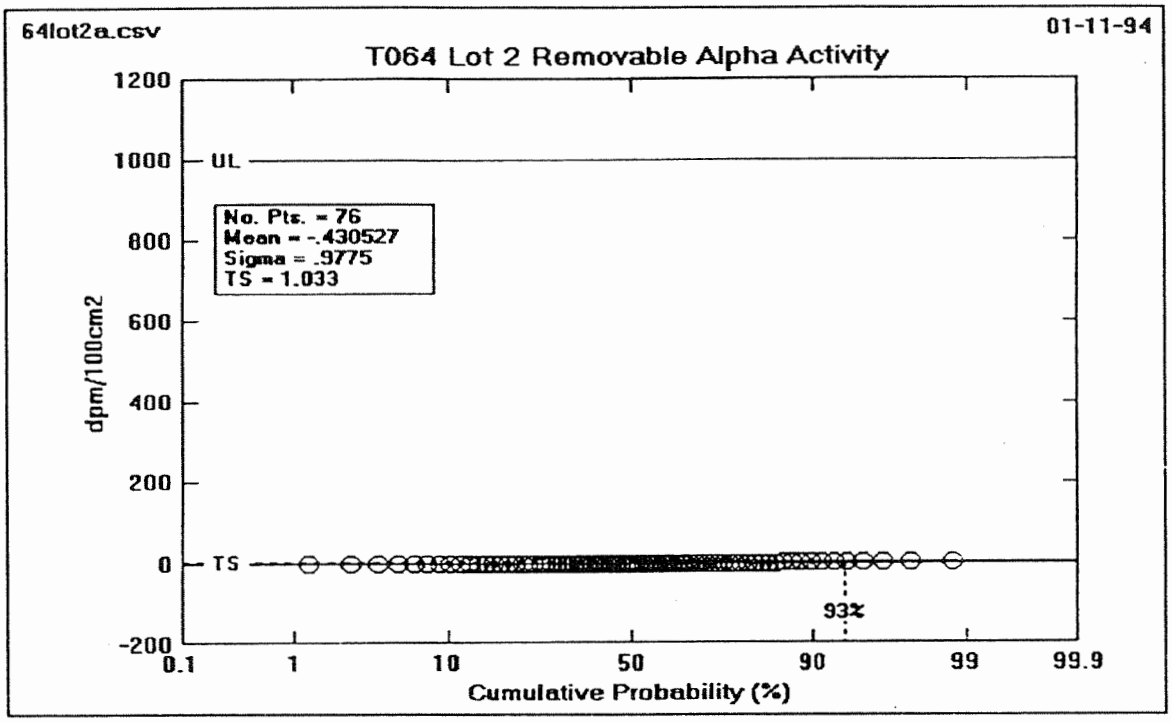


17a.) Scale including Acceptance Limit (UL)

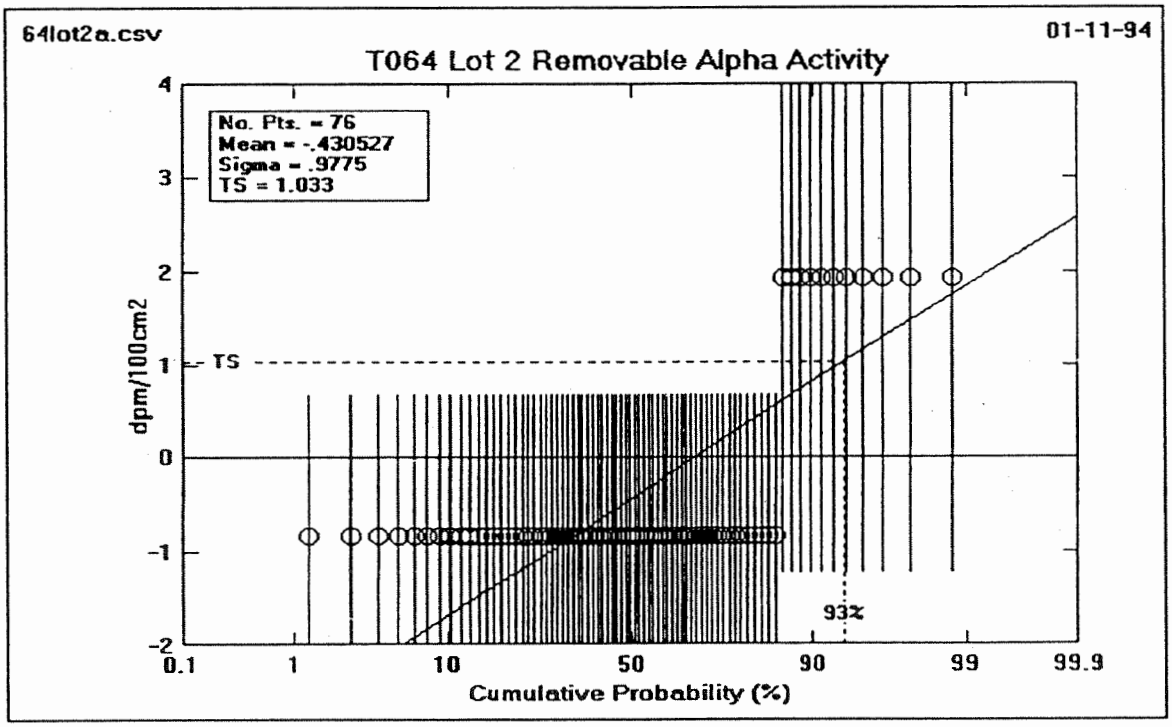


17b.) Expanded Scale

Figure 17: T064 - LOT 2 Total Alpha Activity

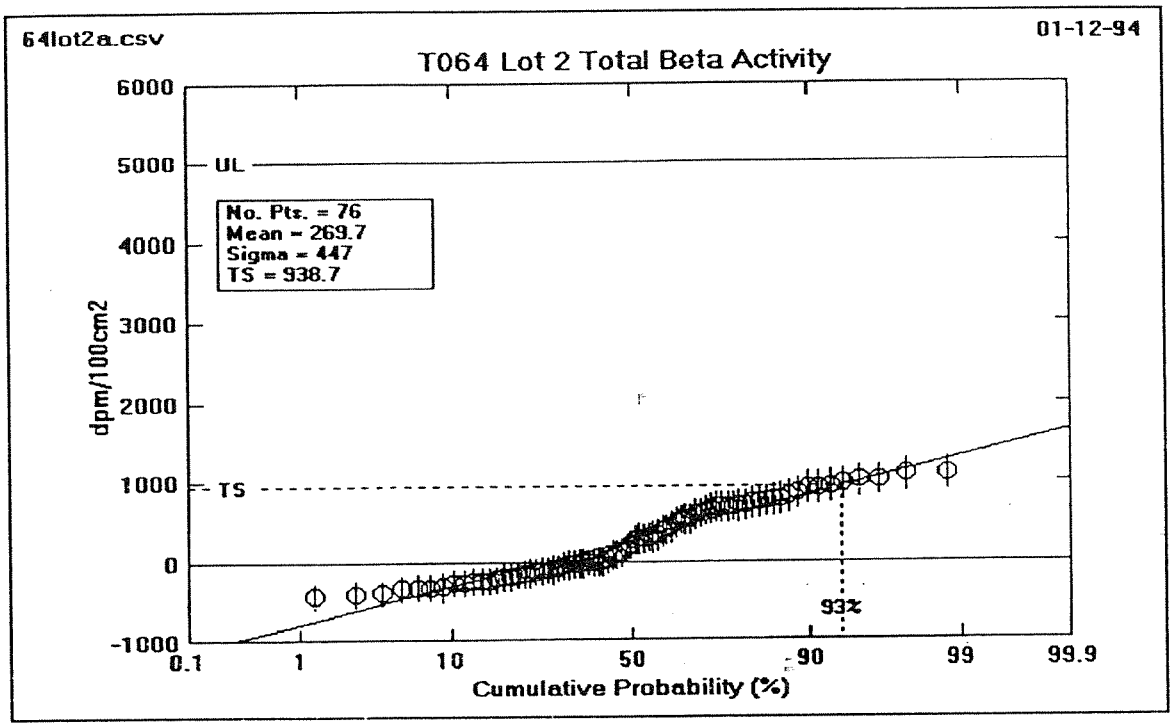


18a.) Scale including Acceptance Limit (UL)

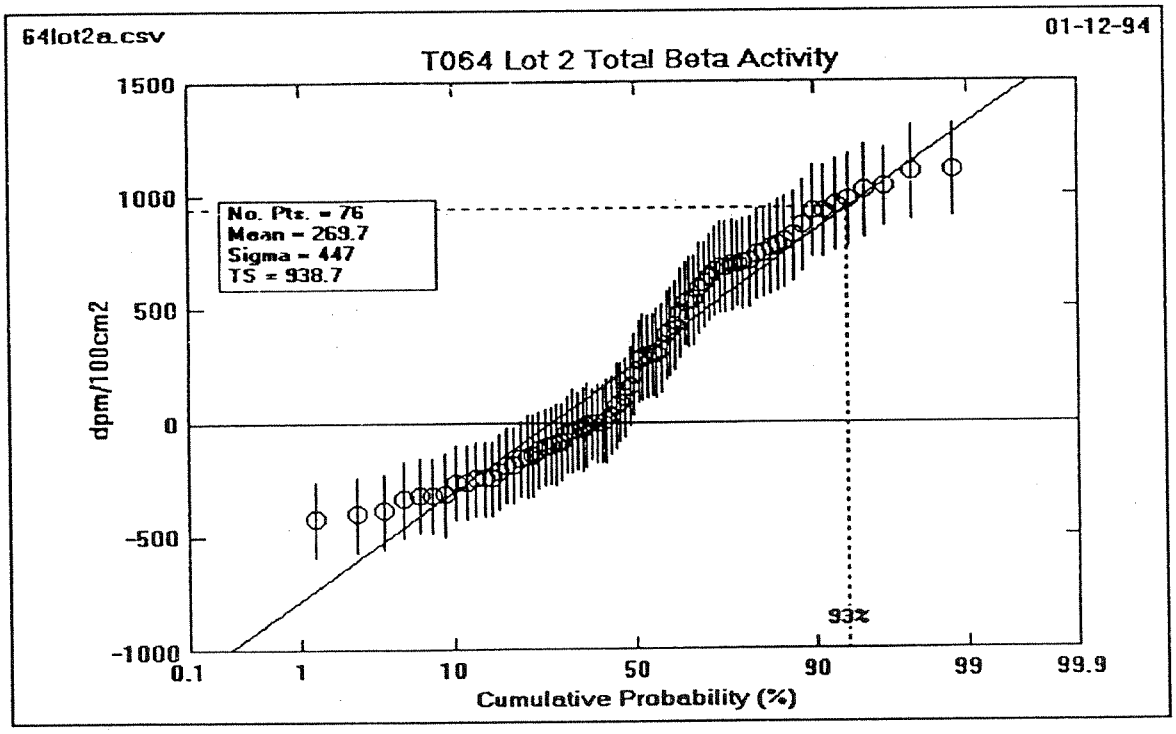


18b.) Expanded Scale

Figure 18: T064 - LOT 2 Removable Alpha Activity

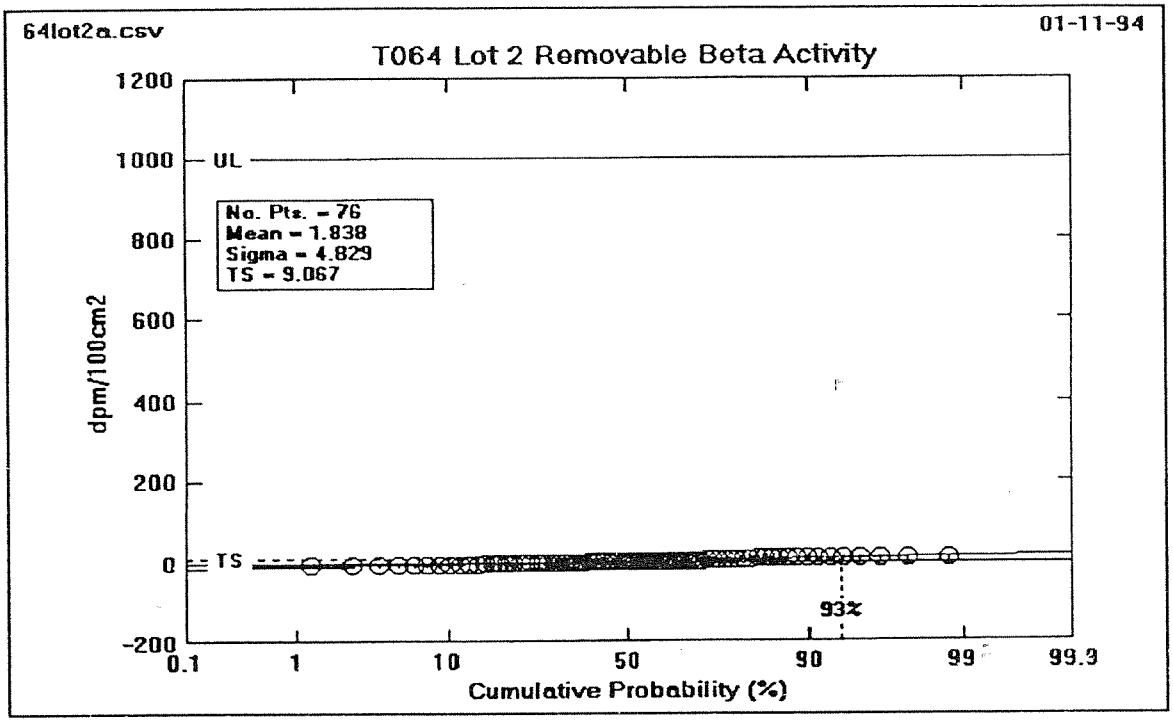


19a.) Scale including Acceptance Limit (UL)

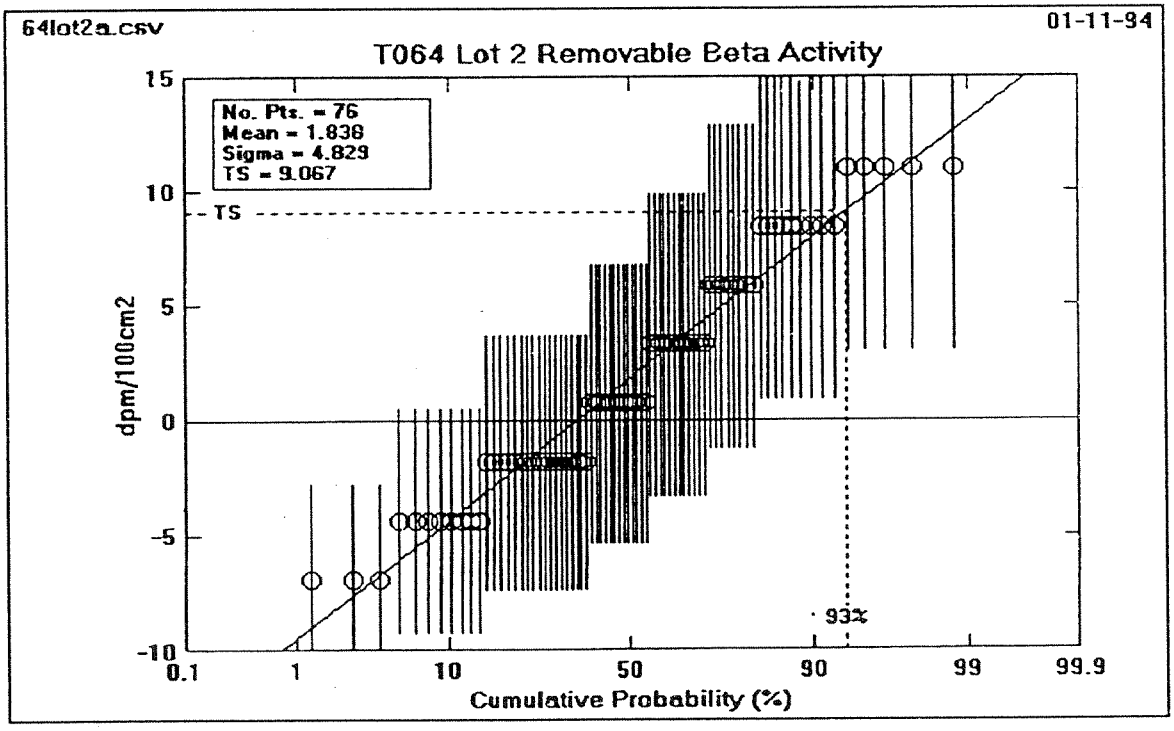


19b.) Expanded Scale

Figure 19: T064 - LOT 2 Total Beta Activity

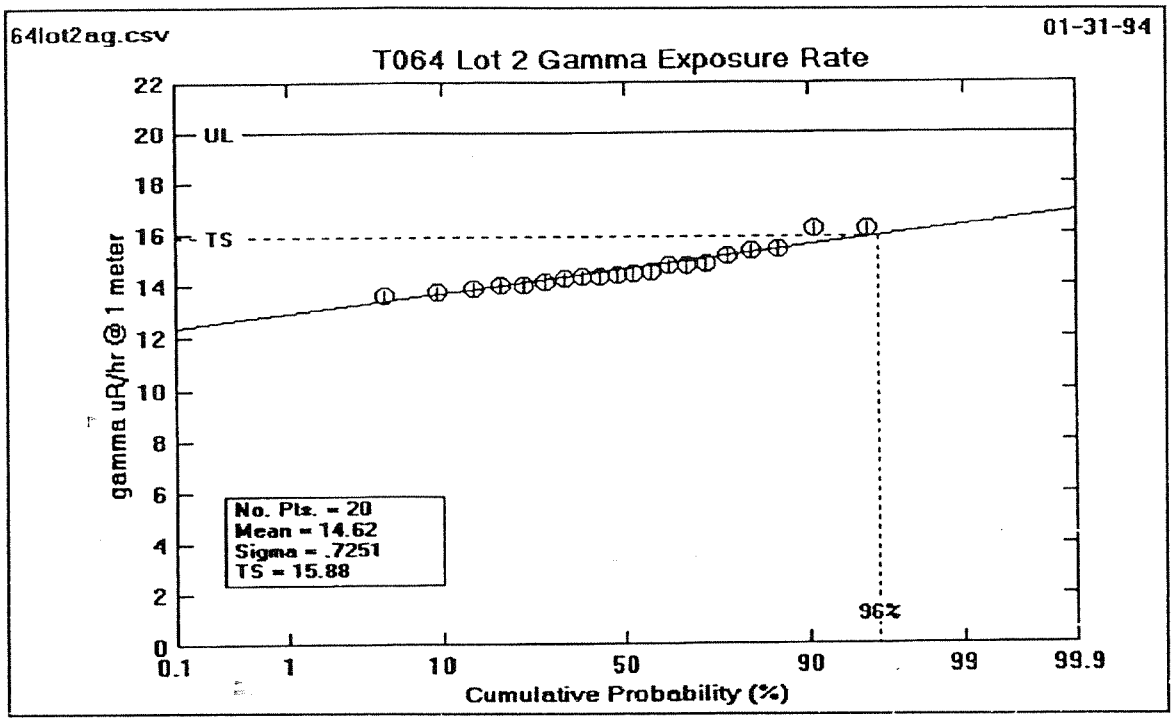


20a.) Scale including Acceptance Limit (UL)



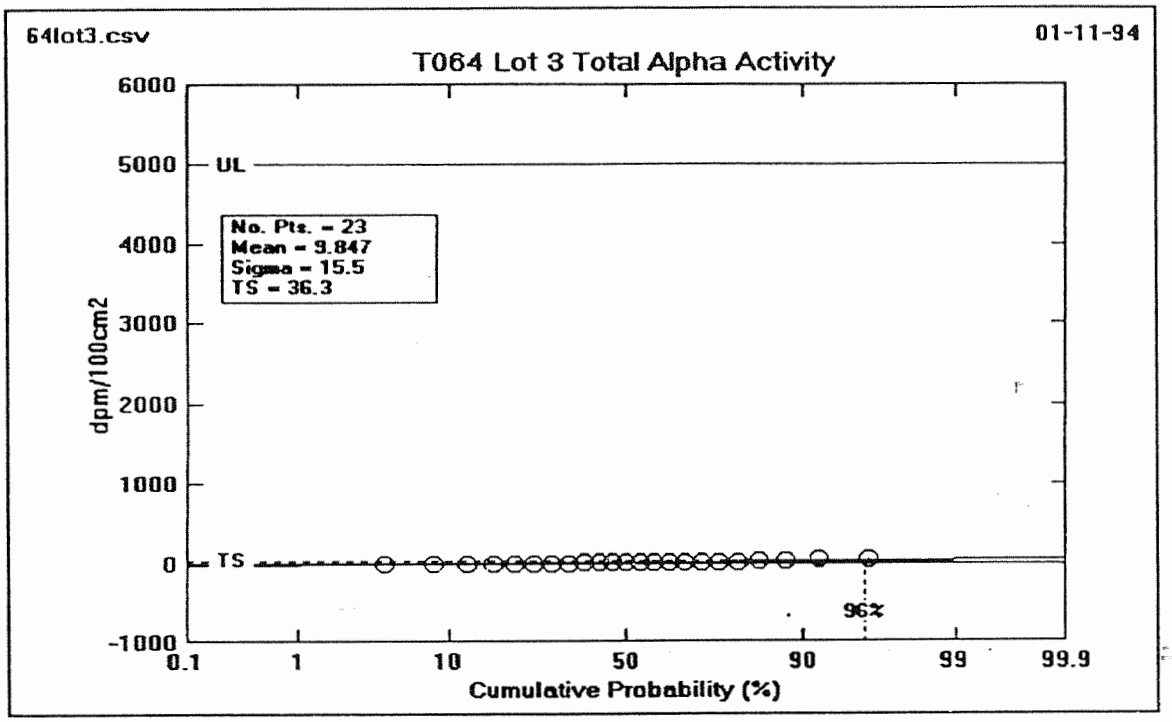
20b.) Expanded Scale

Figure 20: T064 - LOT 2 Removable Beta Activity

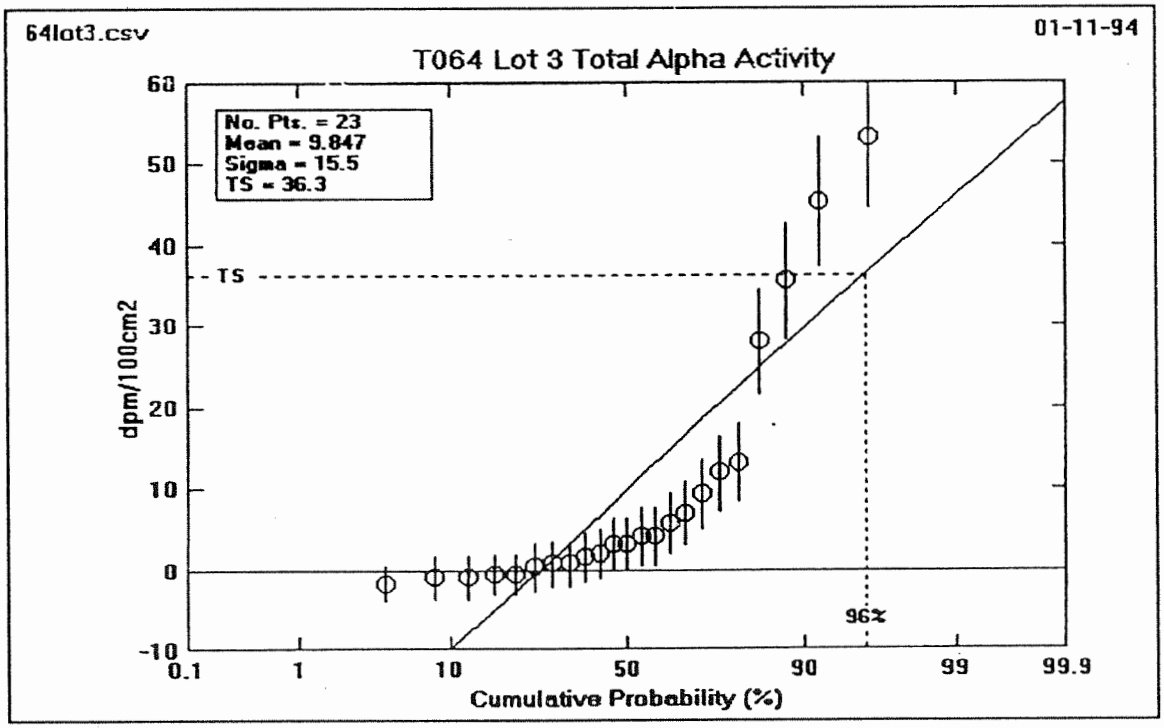


21) Scale including Acceptance Limit (UL)

Figure 21: T064 - LOT 2 Floors Ambient Gamma Exposure Rate

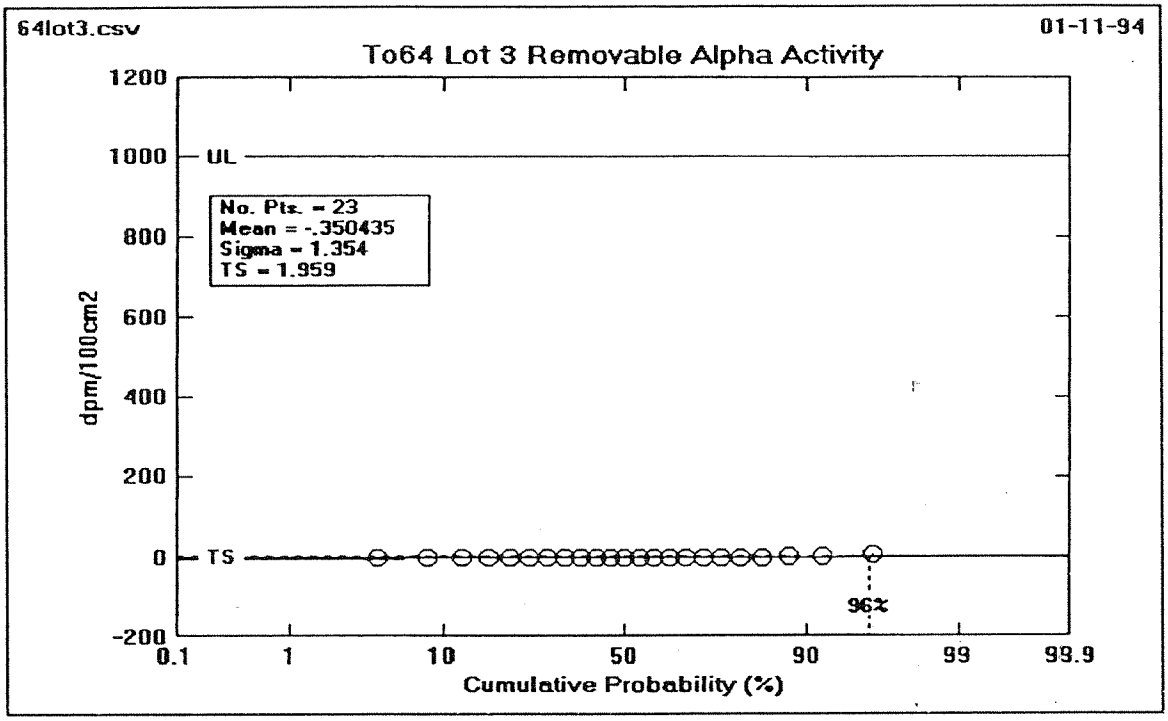


22a.) Scale including Acceptance Limit (UL)

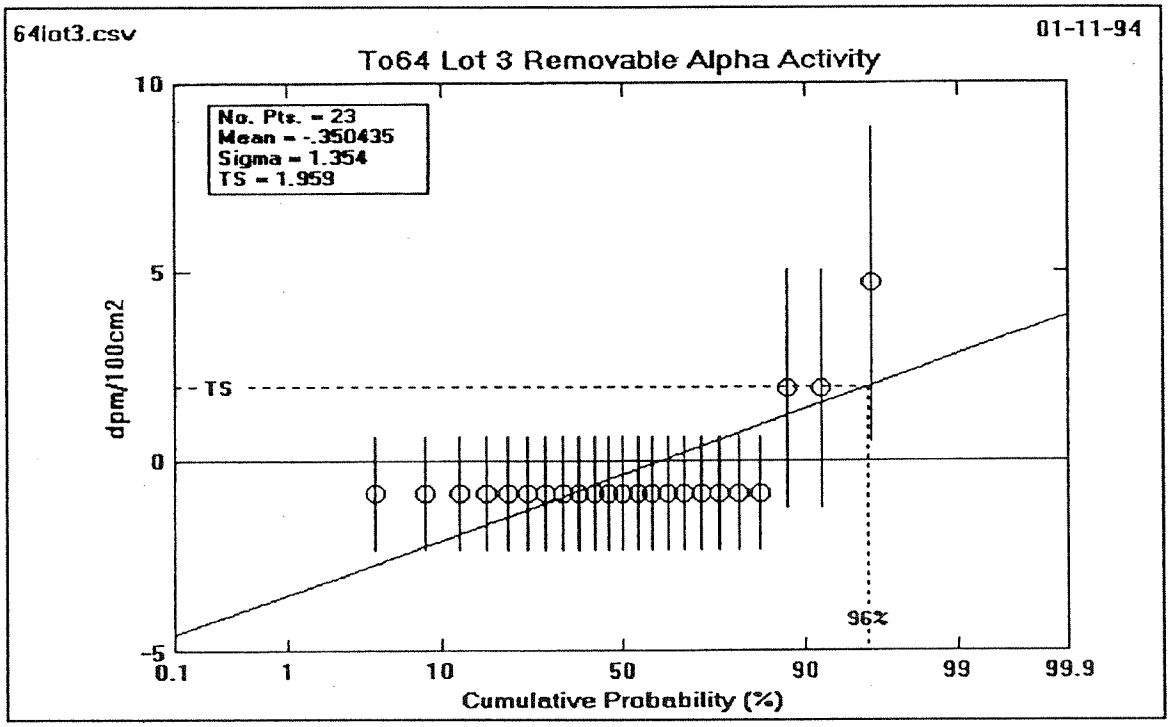


22b.) Expanded Scale

Figure 22: T064 - LOT 3 Total Alpha Activity

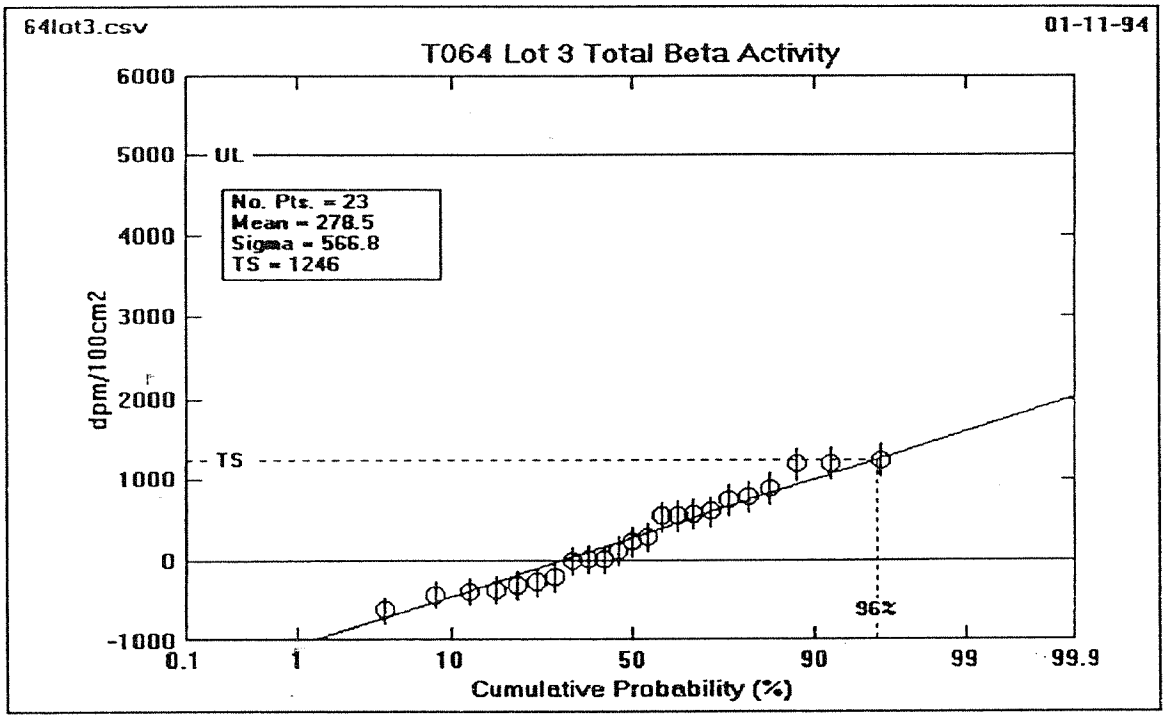


23a.) Scale including Acceptance Limit (UL)

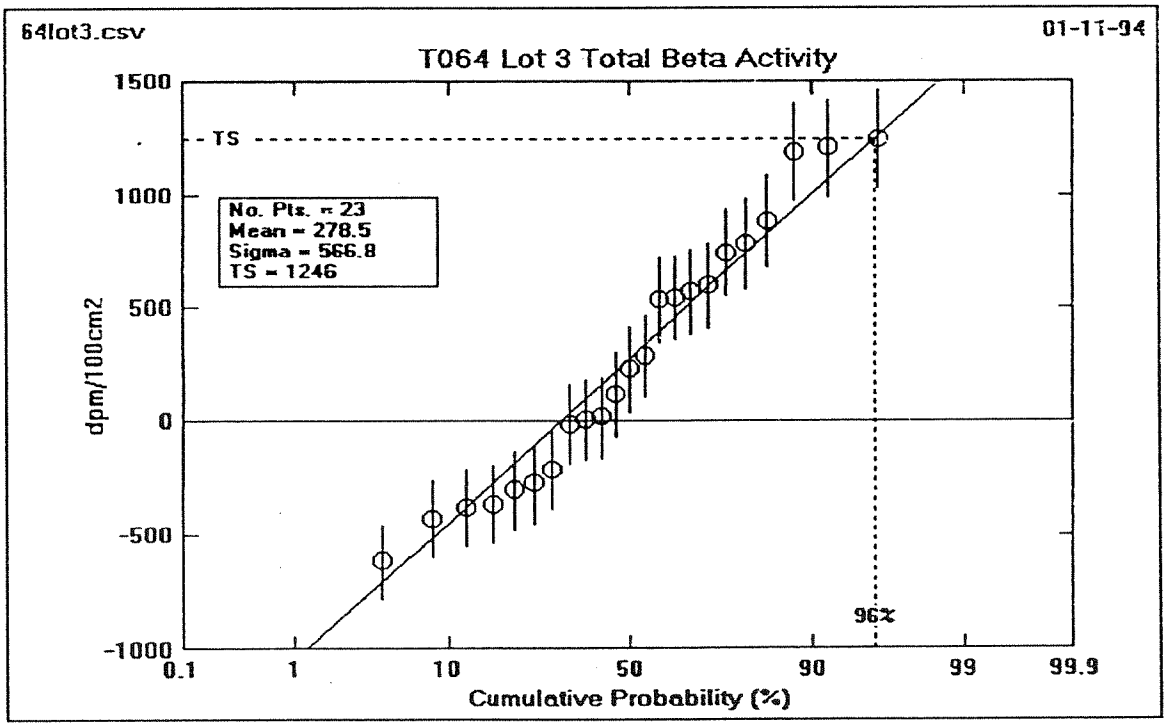


23b.) Expanded Scale

Figure 23: T064 - LOT 3 Removable Alpha Activity

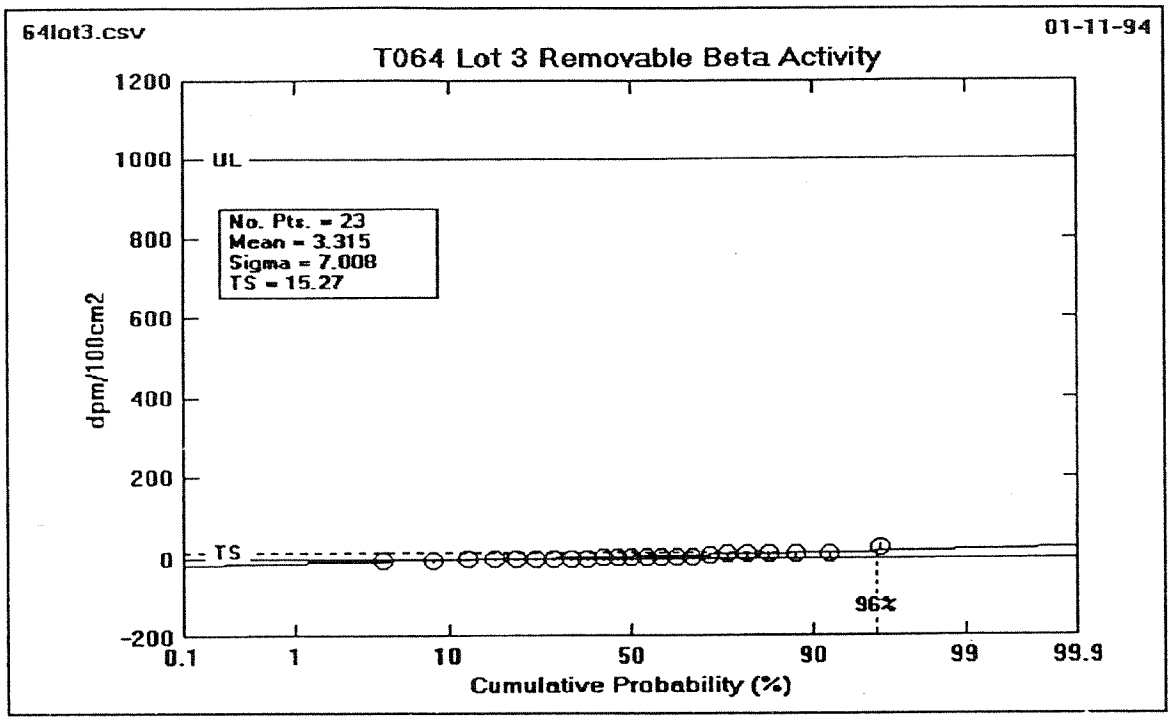


24a.) Scale including Acceptance Limit (UL)

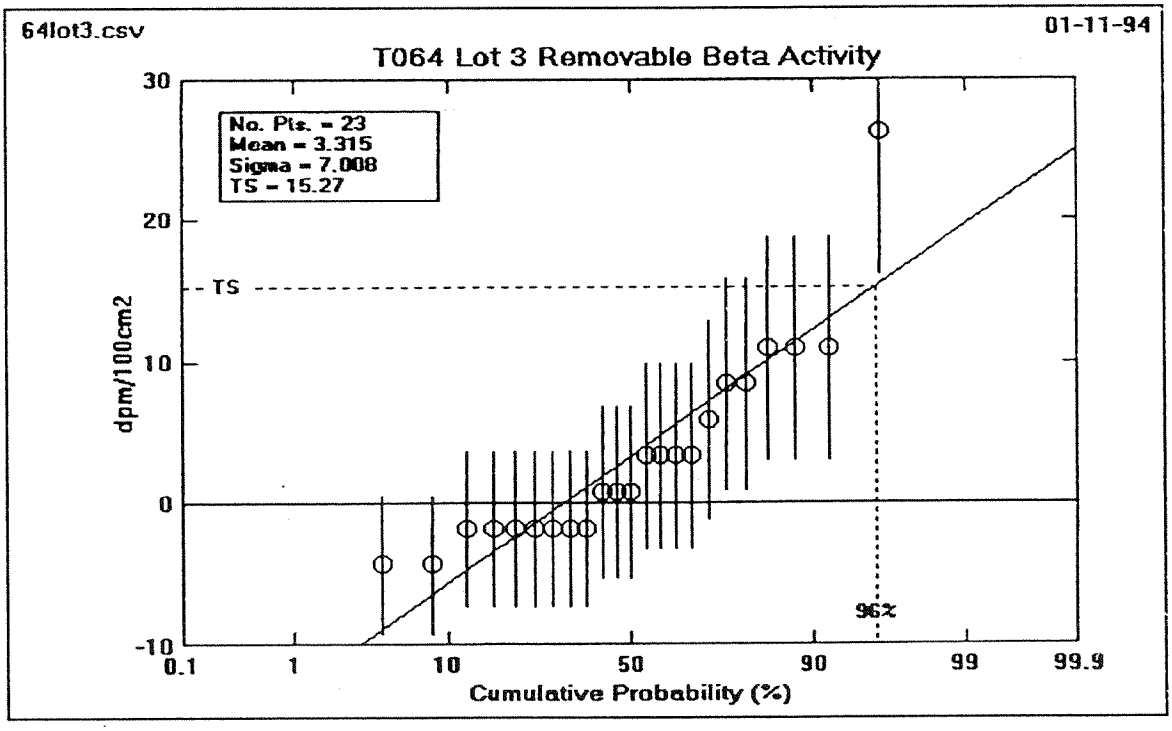


24b.) Expanded Scale

Figure 24: T064 - LOT 3 Total Beta Activity

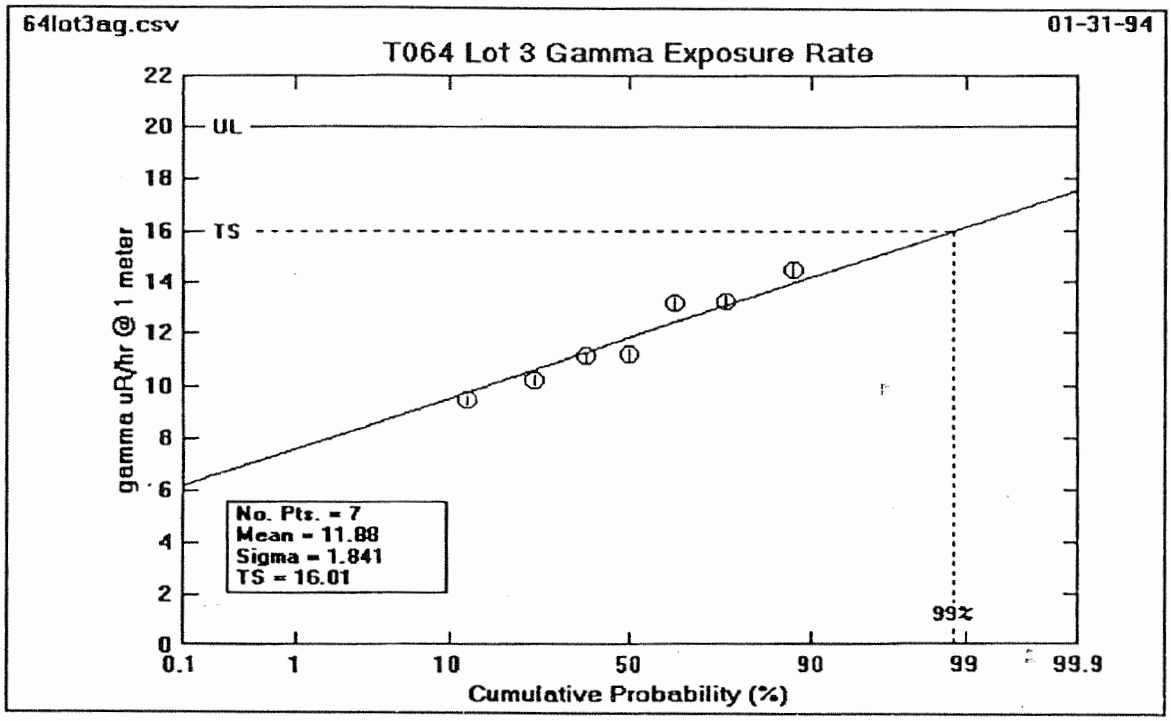


25a.) Scale including Acceptance Limit (UL)



25b.) Expanded Scale

Figure 25: T064 - LOT 3 Removable Beta Activity



26) Scale including Acceptance Limit (UL)

Figure 26: T064 - LOT 3 Floors Ambient Gamma Exposure Rate

4. Supplemental Measurements

In addition to the standard survey measurements, several supplemental measurements were made to provide additional assurance of the quality of the decontamination effort. Special samples of paint from the walls were analyzed in gamma spectrometry. The detected activities are shown below:

	Cs-137	U-234	U-235
Paint (Lot 1)	0.1 dpm/100cm^2	1.6 dpm/100cm^2	0.3 dpm/100cm^2
Paint (Lot 2)	2.0 dpm/100cm^2	1.6 dpm/100cm^2	0.3 dpm/100cm^2
Paint (Lot 3)	0.4 dpm/100cm^2	1.5 dpm/100cm^2	0.1 dpm/100cm^2

All values are below the applicable limits and in agreement with the measurements for removable alpha and beta measurements results from the smears.

APPENDIX A

Building 064 Interior

Lots 1 through 3

Final Survey Data

			GROSS COUNTS IN 5 MINUTES					In 1 MIN		ALPHA					BETA				GAMMA
SAMPLE	GRID		ALPHA			BETA		GAMMA		INSTRUMENT		SMEAR			INSTRUMENT		SMEAR		
NAME	NAME	TOTAL	MAX	REM	TOTAL	MAX	REM	TOTAL	BACKG	EFACT	AFACT	BACKG	EFACT	BACKG	EFACT	AFACT	BACKG	EFACT	EFACT
Floors - Rms 104 & 110	1,1	7		0	358		0	3148	2.563	4.407	1.41	0.3	2.75	279.759	7.705	5	2.7	2.55	0.00465
Floors - Rms 104 & 110	1,11	8		0	394		6	3207	2.563	4.407	1.41	0.3	2.75	279.759	7.705	5	2.7	2.55	0.00465
Floors - Rms 104 & 110	2,6	4		0	427		9	3258	2.563	4.407	1.41	0.3	2.75	279.759	7.705	5	2.7	2.55	0.00465
Floors - Rms 104 & 110	3,9	7		0	370		3	3217	2.563	4.407	1.41	0.3	2.75	279.759	7.705	5	2.7	2.55	0.00465
Floors - Rms 104 & 110	4,7	5		0	400		2	3103	2.563	4.407	1.41	0.3	2.75	279.759	7.705	5	2.7	2.55	0.00465
Floors - Rms 104 & 110	5,4	9		0	435		5	3116	2.563	4.407	1.41	0.3	2.75	279.759	7.705	5	2.7	2.55	0.00465
Floors - Rms 104 & 110	5,12	10		1	412		2	3773	2.563	4.407	1.41	0.3	2.75	279.759	7.705	5	2.7	2.55	0.00465
Floors - Rms 104 & 110	6,5	5		0	406		5	3087	2.563	4.407	1.41	0.3	2.75	279.759	7.705	5	2.7	2.55	0.00465
Floors - Rms 104 & 110	7,2	2		0	410		2	3319	2.563	4.407	1.41	0.3	2.75	279.759	7.705	5	2.7	2.55	0.00465
Floors - Rms 104 & 110	7,12	8		0	383		3	3094	2.563	4.407	1.41	0.3	2.75	279.759	7.705	5	2.7	2.55	0.00465
Floors - Rms 104 & 110	8,8	5		0	393		2	3171	2.563	4.407	1.41	0.3	2.75	279.759	7.705	5	2.7	2.55	0.00465
Floors - Rms 104 & 110	9,3	7		0	396		5	3171	2.563	4.407	1.41	0.3	2.75	279.759	7.705	5	2.7	2.55	0.00465
Floors - Rms 104 & 110	10,6	3		0	392		7	3196	2.563	4.407	1.41	0.3	2.75	279.759	7.705	5	2.7	2.55	0.00465
Floors - Rms 104 & 110	11,4	4		1	421		2	3219	2.563	4.407	1.41	0.3	2.75	279.759	7.705	5	2.7	2.55	0.00465
Floors - Rms 104 & 110	12,7	3		0	382		5	3144	2.563	4.407	1.41	0.3	2.75	279.759	7.705	5	2.7	2.55	0.00465
Floors - Rms 104 & 110	12,10	4		0	399		5	2973	2.563	4.407	1.41	0.3	2.75	279.759	7.705	5	2.7	2.55	0.00465
Floors - Rms 104 & 110	13,5	4		0	387		3	3154	2.563	4.407	1.41	0.3	2.75	279.759	7.705	5	2.7	2.55	0.00465
Floors - Rms 104 & 110	14,11	9		0	415		1	3186	2.563	4.407	1.41	0.3	2.75	279.759	7.705	5	2.7	2.55	0.00465
Floors - Rms 104 & 110	14,2	7		0	358		6	3259	2.563	4.407	1.41	0.3	2.75	279.759	7.705	5	2.7	2.55	0.00465
Floors - Rms 104 & 110	15,5	5		0	392		4	2769	2.563	4.407	1.41	0.3	2.75	279.759	7.705	5	2.7	2.55	0.00465
Ceiling - Rms 104 & 110	1,5	4		0	272		2		2.167	4.445	1.41	0.3	2.75	272.333	7.648	5	2.7	2.55	0.00465
Ceiling - Rms 104 & 110	2,8	2		0	289		4		2.167	4.445	1.41	0.3	2.75	272.333	7.648	5	2.7	2.55	0.00465
Ceiling - Rms 104 & 110	3,12	6		0	334		8		2.167	4.445	1.41	0.3	2.75	272.333	7.648	5	2.7	2.55	0.00465
Ceiling - Rms 104 & 110	3,2	3		0	289		4		2.167	4.445	1.41	0.3	2.75	272.333	7.648	5	2.7	2.55	0.00465
Ceiling - Rms 104 & 110	4,6	2		1	287		8		2.167	4.445	1.41	0.3	2.75	272.333	7.648	5	2.7	2.55	0.00465
Ceiling - Rms 104 & 110	5,9	4		0	287		6		2.167	4.445	1.41	0.3	2.75	272.333	7.648	5	2.7	2.55	0.00465
Ceiling - Rms 104 & 110	6,4	5		0	274		3		2.167	4.445	1.41	0.3	2.75	272.333	7.648	5	2.7	2.55	0.00465
Ceiling - Rms 104 & 110	6,11	4		0	289		2		2.167	4.445	1.41	0.3	2.75	272.333	7.648	5	2.7	2.55	0.00465
Ceiling - Rms 104 & 110	7,1	9		0	320		5		2.167	4.445	1.41	0.3	2.75	272.333	7.648	5	2.7	2.55	0.00465
Ceiling - Rms 104 & 110	8,3	5		0	272		7		2.167	4.445	1.41	0.3	2.75	272.333	7.648	5	2.7	2.55	0.00465
Ceiling - Rms 104 & 110	9,7	4		0	299		2		2.167	4.445	1.41	0.3	2.75	272.333	7.648	5	2.7	2.55	0.00465
Ceiling - Rms 104 & 110	9,12	8		1	304		1		2.167	4.445	1.41	0.3	2.75	272.333	7.648	5	2.7	2.55	0.00465
Ceiling - Rms 104 & 110	10,5	4		0	305		4		2.167	4.445	1.41	0.3	2.75	272.333	7.648	5	2.7	2.55	0.00465
Ceiling - Rms 104 & 110	11,2	5		0	319		5		2.167	4.445	1.41	0.3	2.75	272.333	7.648	5	2.7	2.55	0.00465
Ceiling - Rms 104 & 110	11,11	3		0	299		2		2.167	4.445	1.41	0.3	2.75	272.333	7.648	5	2.7	2.55	0.00465
Ceiling - Rms 104 & 110	12,9	4		1	287		7		2.167	4.445	1.41	0.3	2.75	272.333	7.648	5	2.7	2.55	0.00465
Ceiling - Rms 104 & 110	13,2	6		6	322		5		2.167	4.445	1.41	0.3	2.75	272.333	7.648	5	2.7	2.55	0.00465
Ceiling - Rms 104 & 110	14,3	4		1	326		4		2.167	4.445	1.41	0.3	2.75	272.333	7.648	5	2.7	2.55	0.00465
Ceiling - Rms 104 & 110	15,1	7		1	318		8		2.167	4.445	1.41	0.3	2.75	272.333	7.648	5	2.7	2.55	0.00465

T64L1DAT.WB1

			GROSS COUNTS IN 5 MINUTES					In 1 MIN		ALPHA					BETA			GAMMA
SAMPLE	GRID		ALPHA			BETA		GAMMA		INSTRUMENT		SMEAR			INSTRUMENT		SMEAR	
NAME	NAME	TOTAL	MAX	REM	TOTAL	MAX	REM	TOTAL	BACKG	EFACT	AFACT	BACKG	EFACT	BACKG	EFACT	AFACT	BACKG	EFACT	EFACT
Ceiling - Rms 104 & 110	14,10	6		0	301		4		2.167	4.445	1.41	0.3	2.75	272.333	7.648	5	2.7	2.55	0.00465
Wall North - Rm 110	1,3	9		3	252		3		2.167	4.445	1.41	0.3	2.75	272.333	7.648	5	2.7	2.55	0.00465
Wall North - Rm 110	3,2	12		1	297		4		2.167	4.445	1.41	0.3	2.75	272.333	7.648	5	2.7	2.55	0.00465
Wall North - Rm 110	6,1	13		1	270		3		2.167	4.445	1.41	0.3	2.75	272.333	7.648	5	2.7	2.55	0.00465
Wall North - Rm 110	8,3	11		0	245		3		2.167	4.445	1.41	0.3	2.75	272.333	7.648	5	2.7	2.55	0.00465
Wall North - Rm 110	10,4	9		0	241		3		2.167	4.445	1.41	0.3	2.75	272.333	7.648	5	2.7	2.55	0.00465
Wall North - Rm 110	11,1	14		0	274		5		2.167	4.445	1.41	0.3	2.75	272.333	7.648	5	2.7	2.55	0.00465
Wall North - Rm 110	13,2	10		0	266		1		2.167	4.445	1.41	0.3	2.75	272.333	7.648	5	2.7	2.55	0.00465
Wall North - Rm 110	15,3	11		0	269		3		2.167	4.445	1.41	0.3	2.75	272.333	7.648	5	2.7	2.55	0.00465
Wall East - Rm 110	18,4	14		0	290		7		2.167	4.445	1.41	0.3	2.75	272.333	7.648	5	2.7	2.55	0.00465
Wall East - Rm 110	19,1	16		1	285		5		2.167	4.445	1.41	0.3	2.75	272.333	7.648	5	2.7	2.55	0.00465
Wall East - Rm 110	21,2	22		0	296		1		2.167	4.445	1.41	0.3	2.75	272.333	7.648	5	2.7	2.55	0.00465
Wall East - Rm 110	23,2	11		1	211		5		2.167	4.445	1.41	0.3	2.75	272.333	7.648	5	2.7	2.55	0.00465
Wall East - Rm 110	25,2	11		2	296		7		2.167	4.445	1.41	0.3	2.75	272.333	7.648	5	2.7	2.55	0.00465
Wall East - Rm 110	27,3	9		1	277		7		2.167	4.445	1.41	0.3	2.75	272.333	7.648	5	2.7	2.55	0.00465
Wall South - Rm 110	2,3	12		0	309		5		2.167	4.445	1.41	0.3	2.75	272.333	7.648	5	2.7	2.55	0.00465
Wall South - Rm 110	4,2	12		1	309		5		2.167	4.445	1.41	0.3	2.75	272.333	7.648	5	2.7	2.55	0.00465
Wall South - Rm 110	6,1	10		0	319		3		2.167	4.445	1.41	0.3	2.75	272.333	7.648	5	2.7	2.55	0.00465
Wall South - Rm 110	7-8,5	9		0	289		3		2.167	4.445	1.41	0.3	2.75	272.333	7.648	5	2.7	2.55	0.00465
Wall South - Rm 110	10,3	16		0	292		4		2.167	4.445	1.41	0.3	2.75	272.333	7.648	5	2.7	2.55	0.00465
Wall West - Rm 110	12,2	17		1	289		4		2.167	4.445	1.41	0.3	2.75	272.333	7.648	5	2.7	2.55	0.00465
Wall West - Rm 110	14,3	7		0	277		5		2.167	4.445	1.41	0.3	2.75	272.333	7.648	5	2.7	2.55	0.00465
Wall West - Rm 110	16,2	12		1	277		4		2.167	4.445	1.41	0.3	2.75	272.333	7.648	5	2.7	2.55	0.00465
Wall West - Rm 110	18,3	9		1	306		5		2.167	4.445	1.41	0.3	2.75	272.333	7.648	5	2.7	2.55	0.00465
Wall West - Rm 110	20,1	12		0	294		3		2.167	4.445	1.41	0.3	2.75	272.333	7.648	5	2.7	2.55	0.00465
Wall West - Rm 110	22,4	11		0	325		6		2.167	4.445	1.41	0.3	2.75	272.333	7.648	5	2.7	2.55	0.00465
Wall West - Rm 110	23,3	13		0	271		2		2.167	4.445	1.41	0.3	2.75	272.333	7.648	5	2.7	2.55	0.00465
Wall East - Rm 104(deconned)	2,2	52	376	4	333	311	10		2.000	4.459	1.41	0.3	2.75	268.833	7.742	5	2.7	2.55	0.00465
Wall East - Rm 104	4,2	12		1	307		5		2.167	4.445	1.41	0.3	2.75	272.333	7.648	5	2.7	2.55	0.00465
Wall South - Rm 104(deconned)	5,1	13	227	1	301	284	1		2.000	4.459	1.41	0.3	2.75	268.833	7.742	5	2.7	2.55	0.00465
Wall West - Rm 104	8,3	9		0	261		6		2.167	4.445	1.41	0.3	2.75	272.333	7.648	5	2.7	2.55	0.00465
Wall West - Rm 104	10,1	35		9	280		15		2.167	4.445	1.41	0.3	2.75	272.333	7.648	5	2.7	2.55	0.00465
Wall North - Rm 104	12,3	12		0	298		3		2.167	4.445	1.41	0.3	2.75	272.333	7.648	5	2.7	2.55	0.00465
Wall North - Rm 104	14,2-3	10		1	277		3		2.167	4.445	1.41	0.3	2.75	272.333	7.648	5	2.7	2.55	0.00465
Structure - Trusses Rm 104	St-1	156		1	327		5		2.000	4.459	1.41	0.3	2.75	268.833	7.742	5	2.7	2.55	0.00465
Structure - Trusses Rm 104	St-2	133		0	322		9		2.000	4.459	1.41	0.3	2.75	268.833	7.742	5	2.7	2.55	0.00465
Structure - Trusses Exit Rm 110	St-3	48		3	228		2		2.000	4.459	1.41	0.3	2.75	268.833	7.742	5	2.7	2.55	0.00465
Structure - Trusses NE corner Rm 110	St-4	80		0	325		1		2.000	4.459	1.41	0.3	2.75	268.833	7.742	5	2.7	2.55	0.00465
Structure - Trusses near C(4,10)	St-5	48		1	319		3		2.000	4.459	1.41	0.3	2.75	268.833	7.742	5	2.7	2.55	0.00465

T64L1DAT.WB1

			GROSS COUNTS IN 5 MINUTES					In 1 MIN			ALPHA				BETA			GAMMA
SAMPLE	GRID		ALPHA			BETA		GAMMA		INSTRUMENT		SMEAR			INSTRUMENT		SMEAR	
NAME	NAME	TOTAL	MAX	REM	TOTAL	MAX	REM	TOTAL	BACKG	EFACT	AFACT	BACKG	EFACT	BACKG	EFACT	AFACT	BACKG	EFACT	EFACT
Structure - Trusses near Center	St-6	37		0	304		2		2.000	4.459	1.41	0.3	2.75	268.833	7.742	5	2.7	2.55	0.00465
Structure - Trusses C(6,4) near HTR	St-7	23		1	316		8		2.000	4.459	1.41	0.3	2.75	268.833	7.742	5	2.7	2.55	0.00465
Structure - Beam Ledges - West	Sb-1	77		2	256		3		2.000	4.459	1.41	0.3	2.75	268.833	7.742	5	2.7	2.55	0.00465
Structure - Beam Ledges - Center Wes	Sb-2	37		1	249		3		2.000	4.459	1.41	0.3	2.75	268.833	7.742	5	2.7	2.55	0.00465
Structure - Beam Ledges - Center	Sb-3	59		2	282		5		2.000	4.459	1.41	0.3	2.75	268.833	7.742	5	2.7	2.55	0.00465
Structure - Beam Ledges - Center Eas	Sb-4	111		0	288		4		2.000	4.459	1.41	0.3	2.75	268.833	7.742	5	2.7	2.55	0.00465
Structure - Beam Ledges - East	Sb-5	126		0	299		2		2.000	4.459	1.41	0.3	2.75	268.833	7.742	5	2.7	2.55	0.00465
Structure - Heater Outside Wall	Sh-1	6		0	266		2		2.000	4.459	1.41	0.3	2.75	268.833	7.742	5	2.7	2.55	0.00465
Structure - Heater Inside Grating	Sh-2	4		1	272		3		2.000	4.459	1.41	0.3	2.75	268.833	7.742	5	2.7	2.55	0.00465
Structure - Heater Inside Wall	Sh-3	2		0	239		5		2.000	4.459	1.41	0.3	2.75	268.833	7.742	5	2.7	2.55	0.00465

BUILDING 064 - FINAL SURVEY DATA FOR LOT 2

					GROSS COUNTS IN 5 MINUTES						ALPHA				BETA			GAMMA	
SAMPLE	GRID		ALPHA			BETA		GAMMA		INSTRUMENT		SMEAR			INSTRUMENT		SMEAR		
NAME	NAME	TOTAL	MAX	REM	TOTAL	MAX	REM	TOTAL	BACKG	EFACT	AFACT	BACKG	EFACT	BACKG	EFACT	AFACT	BACKG	EFACT	BACKG	EFACT
Floors - Rm 114	1,4	3		1	397		5	3294	2.563	4.407	1.41	0.3	2.75	274.833	7.995	5	2.7	2.55		0.00465
Floors - Rm 114	2,1	2		0	402		4	3314	2.563	4.407	1.41	0.3	2.75	274.833	7.995	5	2.7	2.55		0.00465
Floors - Rm 114	3,7	6		0	360		2	3172	2.563	4.407	1.41	0.3	2.75	274.833	7.995	5	2.7	2.55		0.00465
Floors - Rm 114	2,10	0		0	391		4	3487	2.563	4.407	1.41	0.3	2.75	274.833	7.995	5	2.7	2.55		0.00465
Floors - Rm 114	5,12	4		0	412		1	3373	2.563	4.407	1.41	0.3	2.75	274.833	7.995	5	2.7	2.55		0.00465
Floors - Rm 114	4,5	7		0	383		7	2966	2.563	4.407	1.41	0.3	2.75	274.833	7.995	5	2.7	2.55		0.00465
Floors - Rm 114	5,2	4		0	377		2	3110	2.563	4.407	1.41	0.3	2.75	274.833	7.995	5	2.7	2.55		0.00465
Floors - Rm 114	6,6	3		0	394		6	3102	2.563	4.407	1.41	0.3	2.75	274.833	7.995	5	2.7	2.55		0.00465
Floors - Rm 114	7,3	5		0	367		5	3120	2.563	4.407	1.41	0.3	2.75	274.833	7.995	5	2.7	2.55		0.00465
Floors - Rm 114	8,8	2		0	413		3	3083	2.563	4.407	1.41	0.3	2.75	274.833	7.995	5	2.7	2.55		0.00465
Floors - Rm 114	7,11	2		0	391		2	3192	2.563	4.407	1.41	0.3	2.75	274.833	7.995	5	2.7	2.55		0.00465
Floors - Rm 114	9,4	6		0	393		6	3079	3.167	4.394	1.41	0.3	2.75	293.167	7.775	5	2.7	2.55		0.00465
Floors - Rm 114	10,1	5		0	355		6	2932	3.167	4.394	1.41	0.3	2.75	293.167	7.775	5	2.7	2.55		0.00465
Floors - Rm 114	11,7	7		0	382		6	2983	3.167	4.394	1.41	0.3	2.75	293.167	7.775	5	2.7	2.55		0.00465
Floors - Rm 114	12,6	6		0	395		2	3017	3.167	4.394	1.41	0.3	2.75	293.167	7.775	5	2.7	2.55		0.00465
Floors - Rm 114	12,10	6		1	335		4	3252	3.167	4.394	1.41	0.3	2.75	293.167	7.775	5	2.7	2.55		0.00465
Floors - Rm 114	13,1	8		0	362		3	3047	3.167	4.394	1.41	0.3	2.75	293.167	7.775	5	2.7	2.55		0.00465
Floors - Rm 114	14,5	7		0	369		2	3065	3.167	4.394	1.41	0.3	2.75	293.167	7.775	5	2.7	2.55		0.00465
Floors - Rm 114	15,2	5		0	348		3	3010	3.167	4.394	1.41	0.3	2.75	293.167	7.775	5	2.7	2.55		0.00465
Floors - Rm 114	15,11	5		1	384		4	3481	3.167	4.394	1.41	0.3	2.75	293.167	7.775	5	2.7	2.55		0.00465
Ceiling - Rm 114	1,1	4		0	268		5		3.333	4.434	1.41	0.3	2.75	281.333	7.358	5	2.7	2.55		0.00465
Ceiling - Rm 114	2,4	6		1	256		2		3.333	4.434	1.41	0.3	2.75	281.333	7.358	5	2.7	2.55		0.00465
Ceiling - Rm 114	3,6	4		0	229		7		3.333	4.434	1.41	0.3	2.75	281.333	7.358	5	2.7	2.55		0.00465
Ceiling - Rm 114	4,3	5		0	252		2		3.333	4.434	1.41	0.3	2.75	281.333	7.358	5	2.7	2.55		0.00465
Ceiling - Rm 114	5,2	6		0	275		5		3.333	4.434	1.41	0.3	2.75	281.333	7.358	5	2.7	2.55		0.00465
Ceiling - Rm 114	6,6	1		1	236		4		3.333	4.434	1.41	0.3	2.75	281.333	7.358	5	2.7	2.55		0.00465
Ceiling - Rm 114	7,7	8		0	224		1		3.333	4.434	1.41	0.3	2.75	281.333	7.358	5	2.7	2.55		0.00465
Ceiling - Rm 114	8,9	3		0	238		5		3.333	4.434	1.41	0.3	2.75	281.333	7.358	5	2.7	2.55		0.00465
Ceiling - Rm 114	9,4	6		1	256		4		3.333	4.434	1.41	0.3	2.75	281.333	7.358	5	2.7	2.55		0.00465
Ceiling - Rm 114	10,5	7		0	248		2		3.333	4.434	1.41	0.3	2.75	281.333	7.358	5	2.7	2.55		0.00465
Ceiling - Rm 114	11,9	4		0	246		4		3.333	4.434	1.41	0.3	2.75	281.333	7.358	5	2.7	2.55		0.00465
Ceiling - Rm 114	12,2	6		0	246		2		3.333	4.434	1.41	0.3	2.75	281.333	7.358	5	2.7	2.55		0.00465
Ceiling - Rm 114	13,4	4		1	227		4		3.333	4.434	1.41	0.3	2.75	281.333	7.358	5	2.7	2.55		0.00465
Ceiling - Rm 114	14,7	5		0	277		7		3.333	4.434	1.41	0.3	2.75	281.333	7.358	5	2.7	2.55		0.00465
Ceiling - Rm 114	15,6	2		1	248		3		3.333	4.434	1.41	0.3	2.75	281.333	7.358	5	2.7	2.55		0.00465
Ceiling - Rm 114	13,12	7		0	265		2		3.333	4.434	1.41	0.3	2.75	281.333	7.358	5	2.7	2.55		0.00465
Ceiling - Rm 114	10,10	6		0	238		4		3.333	4.434	1.41	0.3	2.75	281.333	7.358	5	2.7	2.55		0.00465
Ceiling - Rm 114	8,12	4		0	267		3		3.333	4.434	1.41	0.3	2.75	281.333	7.358	5	2.7	2.55		0.00465
Ceiling - Rm 114	4,11	2		0	270		0		3.333	4.434	1.41	0.3	2.75	281.333	7.358	5	2.7	2.55		0.00465

					GROSS COUNTS IN 5 MINUTES					ALPHA					BETA				GAMMA	
SAMPLE	GRID		ALPHA			BETA		GAMMA		INSTRUMENT		SMEAR			INSTRUMENT		SMEAR			
NAME	NAME	TOTAL	MAX	REM	TOTAL	MAX	REM	TOTAL	BACKG	EFACT	AFACT	BACKG	EFACT	BACKG	EFACT	AFACT	BACKG	EFACT	BACKG	EFACT
Ceiling - Rm 114	1,10	2		1	248		2		3.333	4.434	1.41	0.3	2.75	281.333	7.358	5	2.7	2.55		0.00465
Wall - South Rm 114	3,1	5		0	311		5		2.167	4.379	1.41	0.3	2.75	274.833	7.995	5	2.7	2.55		0.00465
Wall - South Rm 114	4,4	5		0	278		2		2.167	4.379	1.41	0.3	2.75	278.333	7.421	5	2.7	2.55		0.00465
Wall - South Rm 114	5,2	3		0	276		7		2.167	4.379	1.41	0.3	2.75	274.833	7.995	5	2.7	2.55		0.00465
Wall - South Rm 114	8,3	2		0	257		1		2.167	4.379	1.41	0.3	2.75	274.833	7.995	5	2.7	2.55		0.00465
Wall - South Rm 114	8,5	2		0	257		3		2.167	4.379	1.41	0.3	2.75	278.333	7.421	5	2.7	2.55		0.00465
Wall - South Rm 114	10,1	4		0	263		2		2.167	4.379	1.41	0.3	2.75	274.833	7.995	5	2.7	2.55		0.00465
Wall - South Rm 114	11,4	4		0	283		1		2.167	4.379	1.41	0.3	2.75	278.333	7.421	5	2.7	2.55		0.00465
Wall - South Rm 114	13,3	2		0	278		1		2.167	4.379	1.41	0.3	2.75	278.333	7.421	5	2.7	2.55		0.00465
Wall - South Rm 114	15,5	3		0	293		3		2.167	4.379	1.41	0.3	2.75	278.333	7.421	5	2.7	2.55		0.00465
Wall - West Rm 114	17,2	4		0	362		5		2.167	4.379	1.41	0.3	2.75	274.833	7.995	5	2.7	2.55		0.00465
Wall - West Rm 114	20,2	4		0	370		2		2.167	4.379	1.41	0.3	2.75	274.833	7.995	5	2.7	2.55		0.00465
Wall - West Rm 114	23,1	3		0	341		2		2.667	4.290	1.41	0.3	2.75	274.833	7.995	5	2.7	2.55		0.00465
Wall - West Rm 114	26,3	3		0	339		6		2.667	4.290	1.41	0.3	2.75	287.833	7.808	5	2.7	2.55		0.00465
Wall - West Rm 114	21,4	2		0	300		4		2.167	4.379	1.41	0.3	2.75	278.333	7.421	5	2.7	2.55		0.00465
Wall - West Rm 114	25,4	3		0	349		3		2.667	4.290	1.41	0.3	2.75	278.333	7.421	5	2.7	2.55		0.00465
Wall - North Rm 114	2,2	5		0	368		6		2.167	4.379	1.41	0.3	2.75	274.833	7.995	5	2.7	2.55		0.00465
Wall - North Rm 114	4,3	3		1	307		6		2.667	4.290	1.41	0.3	2.75	278.333	7.421	5	2.7	2.55		0.00465
Wall - North Rm 114	7,1	1		0	360		3		2.167	4.379	1.41	0.3	2.75	274.833	7.995	5	2.7	2.55		0.00465
Wall - North Rm 114	10,3	2		0	318		3		2.667	4.290	1.41	0.3	2.75	278.333	7.421	5	2.7	2.55		0.00465
Wall - North Rm 114	13,1	1		1	358		2		2.167	4.379	1.41	0.3	2.75	274.833	7.995	5	2.7	2.55		0.00465
Wall - North Rm 114	3,4	5		0	372		2		2.667	4.290	1.41	0.3	2.75	278.333	7.421	5	2.7	2.55		0.00465
Wall - North Rm 114	9,5	4		0	291		6		2.667	4.290	1.41	0.3	2.75	278.333	7.421	5	2.7	2.55		0.00465
Wall - North Rm 114	11,4	3		0	364		0		2.167	4.379	1.41	0.3	2.75	278.333	7.421	5	2.7	2.55		0.00465
Wall - North Rm 114	15,4	6		0	319		2		2.667	4.290	1.41	0.3	2.75	278.333	7.421	5	2.7	2.55		0.00465
Wall - East Rm 114	17,2	4		0	313		6		2.167	4.379	1.41	0.3	2.75	274.833	7.995	5	2.7	2.55		0.00465
Wall - East Rm 114	20,2	2		0	323		1		2.167	4.379	1.41	0.3	2.75	274.833	7.995	5	2.7	2.55		0.00465
Wall - East Rm 114	23,1	5		0	234		4		2.200	3.082	1.41	0.3	2.75	233.5	7.051	5	2.7	2.55		0.00465
Wall - East Rm 114	26,1	3		0	315		3		2.167	4.379	1.41	0.3	2.75	278.333	7.421	5	2.7	2.55		0.00465
Wall - East Rm 114	19,1	8		0	376		5		2.200	3.082	1.41	0.3	2.75	233.5	7.051	5	2.7	2.55		0.00465
Wall - East Rm 114	27,4	4		0	360		0		2.667	4.290	1.41	0.3	2.75	278.333	7.421	5	2.7	2.55		0.00465
Structure - Trusses Rm 114 NW	St-1	4		0	242		3		2.667	4.467	1.41	0.3	2.75	281.333	8.015	5	2.7	2.55		0.00465
Structure - Trusses Rm114 Center	St-2	3		0	278		7		2.667	4.467	1.41	0.3	2.75	281.333	8.015	5	2.7	2.55		0.00465
Structure - Trusses Rm114 SE	St-3	5		0	280		4		2.667	4.467	1.41	0.3	2.75	281.333	8.015	5	2.7	2.55		0.00465
Structure - Beams Rm 114 North	Sb-1	8		0	263		3		2.667	4.467	1.41	0.3	2.75	281.333	8.015	5	2.7	2.55		0.00465
Structure - Beams Rm 114 Center	Sb-2	6		0	277		1		2.667	4.467	1.41	0.3	2.75	281.333	8.015	5	2.7	2.55		0.00465
Structure - Beams Rm 114 South	Sb-3	12		0	291		1		2.667	4.467	1.41	0.3	2.75	281.333	8.015	5	2.7	2.55		0.00465

BUILDING 064 - FINAL SURVEY DATA FOR LOT 3

			GROSS COUNTS IN 5 MINUTES					1 MIN			ALPHA				BETA				GAMMA	
SAMPLE	GRID		ALPHA			BETA		GAMMA		INSTRUMENT		SMEAR			INSTRUMENT		SMEAR			
NAME	NAME	TOTAL	MAX	REM	TOTAL	MAX	REM	TOTAL	BACKG	EFACT	AFACT	BACKG	EFACT	BACKG	EFACT	AFACT	BACKG	EFACT	BACKG	EFACT
Floors - Rm 116	F-1	6		0	437		7	3725	2.667	4.467	1.41	0.3	2.75	281.333	8.015	5	2.7	2.55		0.00465
Floors - Rm 116	F-2	45		0	432		7	2861	2.667	4.467	1.41	0.3	2.75	281.333	8.015	5	2.7	2.55		0.00465
Ceiling - Rm 116	C-1	2		1	296		2		2.667	4.467	1.41	0.3	2.75	281.333	8.015	5	2.7	2.55		0.00465
Wall - West Rm 116	2,2	2		2	392		5		2.667	4.467	1.41	0.3	2.75	281.333	8.015	5	2.7	2.55		0.00465
Wall - North Rm 116	5,1	3		0	430		1		2.667	4.467	1.41	0.3	2.75	281.333	8.015	5	2.7	2.55		0.00465
Wall - East Rm 116	7,3	4		0	379		4		2.667	4.467	1.41	0.3	2.75	281.333	8.015	5	2.7	2.55		0.00465
Wall - South Rm 116	10,2	6		0	310		3		2.667	4.467	1.41	0.3	2.75	281.333	8.015	5	2.7	2.55		0.00465
Floors - Rm 120	3,1	8		0	378		2	2848	2.333	4.393	1.41	0.3	2.75	279.833	7.579	5	2.7	2.55		0.00465
Floors - Rm 120	4,3	10		0	351		2	2414	2.333	4.393	1.41	0.3	2.75	279.833	7.579	5	2.7	2.55		0.00465
Floors - Rm 120	7,3	25		0	352		3	2395	2.333	4.393	1.41	0.3	2.75	279.833	7.579	5	2.7	2.55		0.00465
Floors - Rm 120	8,1	39		0	359		4	2038	2.333	4.393	1.41	0.3	2.75	279.833	7.579	5	2.7	2.55		0.00465
Ceiling - Rm 120	1,4	5		0	244		3		2.333	4.393	1.41	0.3	2.75	279.833	7.579	5	2.7	2.55		0.00465
Ceiling - Rm 120	3,1	5		0	278		2		2.333	4.393	1.41	0.3	2.75	279.833	7.579	5	2.7	2.55		0.00465
Wall - West Rm 120	1,2	4		0	224		6		2.333	4.393	1.41	0.3	2.75	279.833	7.579	5	2.7	2.55		0.00465
Wall - West Rm 120	4,3	7		1	240		4		2.333	4.393	1.41	0.3	2.75	279.833	7.579	5	2.7	2.55		0.00465
Wall - East Rm 120	9,1	3		0	282		2		2.333	4.393	1.41	0.3	2.75	279.833	7.579	5	2.7	2.55		0.00465
Wall - East Rm 120	12,2	3		0	232		13		2.333	4.393	1.41	0.3	2.75	279.833	7.579	5	2.7	2.55		0.00465
Wall - South Rm 120	14,1	1		0	199		2		2.333	4.393	1.41	0.3	2.75	279.833	7.579	5	2.7	2.55		0.00465
Floors - Restroom	F-1	13		0	355		7	2200	2.333	4.393	1.41	0.3	2.75	279.833	7.579	5	2.7	2.55		0.00465
Ceiling - Restroom	C-1	2		0	230		4		2.333	4.393	1.41	0.3	2.75	279.833	7.579	5	2.7	2.55		0.00465
Wall - West Restroom	3,2	12		0	252		1		2.333	4.393	1.41	0.3	2.75	279.833	7.579	5	2.7	2.55		0.00465
Wall - North Restroom	5,2	31		0	318		2		2.333	4.393	1.41	0.3	2.75	279.833	7.579	5	2.7	2.55		0.00465
Wall - East Restroom	7,1	2		0	281		6		2.333	4.393	1.41	0.3	2.75	279.833	7.579	5	2.7	2.55		0.00465

BUILDING 064 - FINAL SURVEY CALCULATED RESULTS FOR LOT 1

SAMPLE NAME	GRID NAME	ALPHA (DPM/100CM2) TOTAL	STD DEV	MAX	STD DEV	REM	STD DEV	BETA (DPM/100CM2) TOTAL	STD DEV	MAX	STD DEV	REM	STD DEV	GAMMA (uR/hr) TOTAL	STD DEV
Floors - Rms 104 & 110	1,1	5.52	3.84			-0.83	1.51	602.81	194.57			-6.89	4.19	14.64	0.26
Floors - Rms 104 & 110	1,11	6.76	4.04			-0.83	1.51	880.18	199.99			8.42	7.52	14.91	0.26
Floors - Rms 104 & 110	2,6	1.79	3.18			-0.83	1.51	1134.43	204.83			16.07	8.72	15.15	0.27
Floors - Rms 104 & 110	3,9	5.52	3.84			-0.83	1.51	695.27	196.39			0.76	6.09	14.96	0.26
Floors - Rms 104 & 110	4,7	3.03	3.42			-0.83	1.51	926.40	200.87			-1.79	5.53	14.43	0.26
Floors - Rms 104 & 110	5,4	8.00	4.23			-0.83	1.51	1196.06	205.98			5.87	7.08	14.49	0.26
Floors - Rms 104 & 110	5,12	9.24	4.41			1.93	3.14	1018.86	202.64			-1.79	5.53	17.54	0.29
Floors - Rms 104 & 110	6,5	3.03	3.42			-0.83	1.51	972.63	201.76			5.87	7.08	14.35	0.26
Floors - Rms 104 & 110	7,2	-0.70	2.65			-0.83	1.51	1003.45	202.35			-1.79	5.53	15.43	0.27
Floors - Rms 104 & 110	7,12	6.76	4.04			-0.83	1.51	795.43	198.35			0.76	6.09	14.39	0.26
Floors - Rms 104 & 110	8,8	3.03	3.42			-0.83	1.51	872.47	199.84			-1.79	5.53	14.75	0.26
Floors - Rms 104 & 110	9,3	5.52	3.84			-0.83	1.51	895.58	200.28			0.76	6.09	14.75	0.26
Floors - Rms 104 & 110	10,6	0.54	2.93			-0.83	1.51	864.77	199.69			10.96	7.94	14.86	0.26
Floors - Rms 104 & 110	11,4	1.79	3.18			1.93	3.14	1088.20	203.95			-1.79	5.53	14.97	0.26
Floors - Rms 104 & 110	12,7	0.54	2.93			-0.83	1.51	787.72	198.20			5.87	7.08	14.62	0.26
Floors - Rms 104 & 110	12,10	1.79	3.18			-0.83	1.51	918.70	200.73			5.87	7.08	13.82	0.25
Floors - Rms 104 & 110	13,5	1.79	3.18			-0.83	1.51	826.24	198.94			0.76	6.09	14.67	0.26
Floors - Rms 104 & 110	14,11	8.00	4.23			-0.83	1.51	1041.97	203.08			-4.34	4.91	14.81	0.26
Floors - Rms 104 & 110	14,2	5.52	3.84			-0.83	1.51	602.81	194.57			8.42	7.52	15.15	0.27
Floors - Rms 104 & 110	15,5	3.03	3.42			-0.83	1.51	864.77	199.69			3.31	6.60	12.88	0.24
Ceiling - Rms 104 & 110	1,5	2.30	3.11			-0.83	1.51	-2.55	178.44			-1.79	5.53		
Ceiling - Rms 104 & 110	2,8	-0.21	2.56			-0.83	1.51	127.47	181.21			3.31	6.60		
Ceiling - Rms 104 & 110	3,12	4.80	3.58			-0.83	1.51	471.64	188.33			13.52	8.34		
Ceiling - Rms 104 & 110	3,2	1.04	2.85			-0.83	1.51	127.47	181.21			3.31	6.60		
Ceiling - Rms 104 & 110	4,6	-0.21	2.56			1.93	3.14	112.17	180.88			13.52	8.34		
Ceiling - Rms 104 & 110	5,9	2.30	3.11			-0.83	1.51	112.17	180.88			8.42	7.52		
Ceiling - Rms 104 & 110	6,4	3.55	3.36			-0.83	1.51	12.75	178.77			0.76	6.09		
Ceiling - Rms 104 & 110	6,11	2.30	3.11			-0.83	1.51	127.47	181.21			-1.79	5.53		
Ceiling - Rms 104 & 110	7,1	8.57	4.19			-0.83	1.51	364.57	186.14			5.87	7.08		
Ceiling - Rms 104 & 110	8,3	3.55	3.36			-0.83	1.51	-2.55	178.44			10.96	7.94		
Ceiling - Rms 104 & 110	9,7	2.30	3.11			-0.83	1.51	203.95	182.81			-1.79	5.53		
Ceiling - Rms 104 & 110	9,12	7.31	4.00			1.93	3.14	242.19	183.61			-4.34	4.91		
Ceiling - Rms 104 & 110	10,5	2.30	3.11			-0.83	1.51	249.84	183.77			3.31	6.60		
Ceiling - Rms 104 & 110	11,2	3.55	3.36			-0.83	1.51	356.92	185.99			5.87	7.08		

SAMPLE NAME	GRID NAME	ALPHA (DPM/100CM2) TOTAL	STD DEV	MAX	STD DEV	REM	STD DEV	BETA (DPM/100CM2) TOTAL	STD DEV	MAX	STD DEV	REM	STD DEV	GAMMA (uR/hr) TOTAL	STD DEV
Ceiling - Rms 104 & 110	11,11	1.04	2.85			-0.83	1.51	203.95	182.81			-1.79	5.53		
Ceiling - Rms 104 & 110	12,9	2.30	3.11			1.93	3.14	112.17	180.88			10.96	7.94		
Ceiling - Rms 104 & 110	13,2	4.80	3.58			15.68	6.90	379.86	186.46			5.87	7.08		
Ceiling - Rms 104 & 110	14,3	2.30	3.11			1.93	3.14	410.46	187.08			3.31	6.60		
Ceiling - Rms 104 & 110	15,1	6.06	3.79			1.93	3.14	349.27	185.83			13.52	8.34		
Ceiling - Rms 104 & 110	14,10	4.80	3.58			-0.83	1.51	219.25	183.13			3.31	6.60		
Wall North - Rm 110	1,3	8.57	4.19			7.43	5.00	-155.51	175.13			0.76	6.09		
Wall North - Rm 110	3,2	12.33	4.72			1.93	3.14	188.66	182.49			3.31	6.60		
Wall North - Rm 110	6,1	13.58	4.88			1.93	3.14	-17.85	178.11			0.76	6.09		
Wall North - Rm 110	8,3	11.07	4.55			-0.83	1.51	-209.05	173.96			0.76	6.09		
Wall North - Rm 110	10,4	8.57	4.19			-0.83	1.51	-239.65	173.29			0.76	6.09		
Wall North - Rm 110	11,1	14.83	5.04			-0.83	1.51	12.75	178.77			5.87	7.08		
Wall North - Rm 110	13,2	9.82	4.37			-0.83	1.51	-48.44	177.45			-4.34	4.91		
Wall North - Rm 110	15,3	11.07	4.55			-0.83	1.51	-25.49	177.95			0.76	6.09		
Wall East - Rm 110	18,4	14.83	5.04			-0.83	1.51	135.12	181.37			10.96	7.94		
Wall East - Rm 110	19,1	17.34	5.34			1.93	3.14	96.88	180.56			5.87	7.08		
Wall East - Rm 110	21,2	24.86	6.16			-0.83	1.51	181.01	182.33			-4.34	4.91		
Wall East - Rm 110	23,2	11.07	4.55			1.93	3.14	-469.09	168.15			5.87	7.08		
Wall East - Rm 110	25,2	11.07	4.55			4.68	4.17	181.01	182.33			10.96	7.94		
Wall East - Rm 110	27,3	8.57	4.19			1.93	3.14	35.69	179.26			10.96	7.94		
Wall South - Rm 110	2,3	12.33	4.72			-0.83	1.51	280.44	184.41			5.87	7.08		
Wall South - Rm 110	4,2	12.33	4.72			1.93	3.14	280.44	184.41			5.87	7.08		
Wall South - Rm 110	6,1	9.82	4.37			-0.83	1.51	356.92	185.99			0.76	6.09		
Wall South - Rm 110	7-8,5	8.57	4.19			-0.83	1.51	127.47	181.21			0.76	6.09		
Wall South - Rm 110	10,3	17.34	5.34			-0.83	1.51	150.42	181.69			3.31	6.60		
Wall West - Rm 110	12,2	18.59	5.49			1.93	3.14	127.47	181.21			3.31	6.60		
Wall West - Rm 110	14,3	6.06	3.79			-0.83	1.51	35.69	179.26			5.87	7.08		
Wall West - Rm 110	16,2	12.33	4.72			1.93	3.14	35.69	179.26			3.31	6.60		
Wall West - Rm 110	18,3	8.57	4.19			1.93	3.14	257.49	183.93			5.87	7.08		
Wall West - Rm 110	20,1	12.33	4.72			-0.83	1.51	165.71	182.01			0.76	6.09		
Wall West - Rm 110	22,4	11.07	4.55			-0.83	1.51	402.81	186.93			8.42	7.52		
Wall West - Rm 110	23,3	13.58	4.88			-0.83	1.51	-10.20	178.28			-1.79	5.53		
Wall East - Rm 104(deconned)	2,2	62.87	9.24	470.27	24.45	10.18	5.70	496.77	189.93	326	186	18.62	9.09		
Wall East - Rm 104	4,2	12.33	4.72			1.93	3.14	265.14	184.09			5.87	7.08		

T64L1DAT.WB1

BUILDING 064 - FINAL SURVEY CALCULATED RESULTS FOR LOT 1

SAMPLE NAME	GRID NAME	ALPHA (DPM/100CM2) TOTAL	ALPHA STD DEV	ALPHA MAX	ALPHA STD DEV	ALPHA REM	ALPHA STD DEV	BETA (DPM/100CM2) TOTAL	BETA STD DEV	BETA MAX	BETA STD DEV	BETA REM	BETA STD DEV	GAMMA (uR/hr) TOTAL	GAMMA STD DEV
Wall South - Rm 104(deconned)	5,1	13.83	4.87	282.91	19.03	1.93	3.14	249.03	184.81	117	182	-4.34	4.91		
Wall West - Rm 104	8,3	8.57	4.19			-0.83	1.51	-86.68	176.63			8.42	7.52		
Wall West - Rm 104	10,1	41.15	7.64			23.93	8.39	58.64	179.75			31.37	10.73		
Wall North - Rm 104	12,3	12.33	4.72			-0.83	1.51	196.30	182.65			0.76	6.09		
Wall North - Rm 104	14,2-3	9.82	4.37			1.93	3.14	35.69	179.26			0.76	6.09		
Structure - Trusses Rm 104	St-1	193.64	15.81			1.93	3.14	450.32	188.98			5.87	7.08		
Structure - Trusses Rm 104	St-2	164.72	14.61			-0.83	1.51	411.61	188.18			16.07	8.72		
Structure - Trusses Exit Rm 110	St-3	57.84	8.89			7.43	5.00	-316.13	172.57			-1.79	5.53		
Structure - Trusses NE corner Rm 110	St-4	98.08	11.39			-0.83	1.51	434.84	188.66			-4.34	4.91		
Structure - Trusses near C(4,10)	St-5	57.84	8.89			1.93	3.14	388.39	187.70			0.76	6.09		
Structure - Trusses near Center	St-6	44.01	7.85			-0.83	1.51	272.26	185.29			-1.79	5.53		
Structure - Trusses C(6,4) near HTR	St-7	26.41	6.29			1.93	3.14	365.16	187.23			13.52	8.34		
Structure - Beam Ledges - West	Sb-1	94.30	11.18			4.68	4.17	-99.35	177.36			0.76	6.09		
Structure - Beam Ledges - Center West	Sb-2	44.01	7.85			1.93	3.14	-153.55	176.17			0.76	6.09		
Structure - Beam Ledges - Center	Sb-3	71.67	9.82			4.68	4.17	101.94	181.70			5.87	7.08		
Structure - Beam Ledges - Center East	Sb-4	137.06	13.37			-0.83	1.51	148.39	182.69			3.31	6.60		
Structure - Beam Ledges - East	Sb-5	155.92	14.23			-0.83	1.51	233.55	184.48			-1.79	5.53		
Structure - Heater Outside Wall	Sh-1	5.03	3.56			-0.83	1.51	-21.94	179.04			-1.79	5.53		
Structure - Heater Inside Grating	Sh-2	2.51	3.08			1.93	3.14	24.52	180.04			0.76	6.09		
Structure - Heater Inside Wall	Sh-3	0.00	2.51			-0.83	1.51	-230.97	174.47			5.87	7.08		

BUILDING 064 - FINAL SURVEY CALCULATED RESULTS FOR LOT 2

SAMPLE	GRID	ALPHA (DPM/100CM2)						BETA (DPM/100CM2)						GAMMA (uR/h)	
NAME	NAME	TOTAL	STD DEV	MAX	STD DEV	REM	STD DEV	TOTAL	STD DEV	MAX	STD DEV	REM	STD DEV	TOTAL	STD DEV
Floors - Rm 114	1,4	0.54	2.93			1.93	3.14	976.67	207.22			5.87	7.08	15.32	0.27
Floors - Rm 114	2,1	-0.70	2.65			-0.83	1.51	1016.64	207.99			3.31	6.60	15.41	0.27
Floors - Rm 114	3,7	4.27	3.64			-0.83	1.51	680.87	201.43			-1.79	5.53	14.75	0.26
Floors - Rm 114	2,10	-3.18	1.99			-0.83	1.51	928.70	206.29			3.31	6.60	16.21	0.27
Floors - Rm 114	5,12	1.79	3.18			-0.83	1.51	1096.58	209.52			-4.34	4.91	15.68	0.27
Floors - Rm 114	4,5	5.52	3.84			-0.83	1.51	864.74	205.05			10.96	7.94	13.79	0.25
Floors - Rm 114	5,2	1.79	3.18			-0.83	1.51	816.78	204.11			-1.79	5.53	14.46	0.26
Floors - Rm 114	6,6	0.54	2.93			-0.83	1.51	952.68	206.75			8.42	7.52	14.42	0.26
Floors - Rm 114	7,3	3.03	3.42			-0.83	1.51	736.83	202.54			5.87	7.08	14.51	0.26
Floors - Rm 114	8,8	-0.70	2.65			-0.83	1.51	1104.58	209.67			0.76	6.09	14.34	0.26
Floors - Rm 114	7,11	-0.70	2.65			-0.83	1.51	928.70	206.29			-1.79	5.53	14.84	0.26
Floors - Rm 114	9,4	3.51	3.75			-0.83	1.51	776.23	203.67			8.42	7.52	14.32	0.26
Floors - Rm 114	10,1	2.27	3.54			-0.83	1.51	480.77	197.95			8.42	7.52	13.63	0.25
Floors - Rm 114	11,7	4.75	3.95			-0.83	1.51	690.70	202.03			8.42	7.52	13.87	0.25
Floors - Rm 114	12,6	3.51	3.75			-0.83	1.51	791.78	203.97			-1.79	5.53	14.03	0.26
Floors - Rm 114	12,10	3.51	3.75			1.93	3.14	325.26	194.87			3.31	6.60	15.12	0.27
Floors - Rm 114	13,1	5.99	4.14			-0.83	1.51	535.19	199.02			0.76	6.09	14.17	0.26
Floors - Rm 114	14,5	4.75	3.95			-0.83	1.51	589.62	200.08			-1.79	5.53	14.25	0.26
Floors - Rm 114	15,2	2.27	3.54			-0.83	1.51	426.34	196.88			0.76	6.09	14.00	0.26
Floors - Rm 114	15,11	2.27	3.54			1.93	3.14	706.25	202.33			3.31	6.60	16.19	0.27
Ceiling - Rm 114	1,1	0.83	3.39			-0.83	1.51	-98.11	172.46			5.87	7.08		
Ceiling - Rm 114	2,4	3.33	3.82			1.93	3.14	-186.41	170.56			-1.79	5.53		
Ceiling - Rm 114	3,6	0.83	3.39			-0.83	1.51	-385.07	166.22			10.96	7.94		
Ceiling - Rm 114	4,3	2.08	3.61			-0.83	1.51	-215.84	169.93			-1.79	5.53		
Ceiling - Rm 114	5,2	3.33	3.82			-0.83	1.51	-46.60	173.55			5.87	7.08		
Ceiling - Rm 114	6,6	-2.92	2.60			1.93	3.14	-333.57	167.36			3.31	6.60		
Ceiling - Rm 114	7,7	5.83	4.21			-0.83	1.51	-421.86	165.41			-4.34	4.91		
Ceiling - Rm 114	8,9	-0.42	3.15			-0.83	1.51	-318.85	167.68			5.87	7.08		
Ceiling - Rm 114	9,4	3.33	3.82			1.93	3.14	-186.41	170.56			3.31	6.60		
Ceiling - Rm 114	10,5	4.58	4.02			-0.83	1.51	-245.27	169.29			-1.79	5.53		
Ceiling - Rm 114	11,9	0.83	3.39			-0.83	1.51	-259.99	168.97			3.31	6.60		
Ceiling - Rm 114	12,2	3.33	3.82			-0.83	1.51	-259.99	168.97			-1.79	5.53		
Ceiling - Rm 114	13,4	0.83	3.39			1.93	3.14	-399.79	165.90			3.31	6.60		

T64L2DAT.WB1

SAMPLE NAME	GRID NAME	ALPHA (DPM/100CM2) TOTAL	STD DEV	MAX	STD DEV	REM	STD DEV	BETA (DPM/100CM2) TOTAL	STD DEV	MAX	STD DEV	REM	STD DEV	GAMMA (uR/h) TOTAL	STD DEV
Ceiling - Rm 114	14,7	2.08	3.61			-0.83	1.51	-31.89	173.87			10.96	7.94		
Ceiling - Rm 114	15,6	-1.67	2.89			1.93	3.14	-245.27	169.29			0.76	6.09		
Ceiling - Rm 114	13,12	4.58	4.02			-0.83	1.51	-120.18	171.99			-1.79	5.53		
Ceiling - Rm 114	10,10	3.33	3.82			-0.83	1.51	-318.85	167.68			3.31	6.60		
Ceiling - Rm 114	8,12	0.83	3.39			-0.83	1.51	-105.47	172.30			0.76	6.09		
Ceiling - Rm 114	4,11	-1.67	2.89			-0.83	1.51	-83.39	172.77			-6.89	4.19		
Ceiling - Rm 114	1,10	-1.67	2.89			1.93	3.14	-245.27	169.29			-1.79	5.53		
Wall - South Rm 114	3,1	3.50	3.31			-0.83	1.51	289.14	193.50			5.87	7.08		
Wall - South Rm 114	4,4	3.50	3.31			-0.83	1.51	-2.47	175.03			-1.79	5.53		
Wall - South Rm 114	5,2	1.03	2.81			-0.83	1.51	9.33	187.63			10.96	7.94		
Wall - South Rm 114	8,3	-0.21	2.52			-0.83	1.51	-142.57	184.37			-4.34	4.91		
Wall - South Rm 114	8,5	-0.21	2.52			-0.83	1.51	-158.31	171.69			0.76	6.09		
Wall - South Rm 114	10,1	2.26	3.07			-0.83	1.51	-94.60	185.40			-1.79	5.53		
Wall - South Rm 114	11,4	2.26	3.07			-0.83	1.51	34.63	175.81			-4.34	4.91		
Wall - South Rm 114	13,3	-0.21	2.52			-0.83	1.51	-2.47	175.03			-4.34	4.91		
Wall - South Rm 114	15,5	1.03	2.81			-0.83	1.51	108.84	177.37			0.76	6.09		
Wall - West Rm 114	17,2	2.26	3.07			-0.83	1.51	696.86	201.75			5.87	7.08		
Wall - West Rm 114	20,2	2.26	3.07			-0.83	1.51	760.81	203.01			-1.79	5.53		
Wall - West Rm 114	23,1	0.40	2.88			-0.83	1.51	528.97	198.39			-1.79	5.53		
Wall - West Rm 114	26,3	0.40	2.88			-0.83	1.51	399.53	195.50			8.42	7.52		
Wall - West Rm 114	21,4	-0.21	2.52			-0.83	1.51	160.78	178.46			3.31	6.60		
Wall - West Rm 114	25,4	0.40	2.88			-0.83	1.51	524.39	185.86			0.76	6.09		
Wall - North Rm 114	2,2	3.50	3.31			-0.83	1.51	744.82	202.69			8.42	7.52		
Wall - North Rm 114	4,3	0.40	2.88			1.93	3.14	212.73	179.53			8.42	7.52		
Wall - North Rm 114	7,1	-1.44	2.20			-0.83	1.51	680.87	201.43			0.76	6.09		
Wall - North Rm 114	10,3	-0.81	2.61			-0.83	1.51	294.35	181.21			0.76	6.09		
Wall - North Rm 114	13,1	-1.44	2.20			1.93	3.14	664.88	201.11			-1.79	5.53		
Wall - North Rm 114	3,4	2.82	3.35			-0.83	1.51	695.07	189.24			-1.79	5.53		
Wall - North Rm 114	9,5	1.61	3.12			-0.83	1.51	93.99	177.06			8.42	7.52		
Wall - North Rm 114	11,4	1.03	2.81			-0.83	1.51	635.70	188.07			-6.89	4.19		
Wall - North Rm 114	15,4	4.03	3.56			-0.83	1.51	301.77	181.36			-1.79	5.53		
Wall - East Rm 114	17,2	2.26	3.07			-0.83	1.51	305.12	193.83			8.42	7.52		
Wall - East Rm 114	20,2	-0.21	2.52			-0.83	1.51	385.07	195.47			-4.34	4.91		

T64L2DAT.WB1

BUILDING 064 - FINAL SURVEY CALCULATED RESULTS FOR LOT 2

SAMPLE NAME	GRID NAME	ALPHA (DPM/100CM2) TOTAL	ALPHA STD DEV	ALPHA MAX	ALPHA STD DEV	ALPHA REM	ALPHA STD DEV	BETA (DPM/100CM2) TOTAL	BETA STD DEV	BETA MAX	BETA STD DEV	BETA REM	BETA STD DEV	GAMMA (uR/h) TOTAL	GAMMA STD DEV
Wall - East Rm 114	23,1	2.43	2.33			-0.83	1.51	3.53	152.45			3.31	6.60		
Wall - East Rm 114	26,1	1.03	2.81			-0.83	1.51	272.09	180.76			0.76	6.09		
Wall - East Rm 114	19,1	5.04	2.78			-0.83	1.51	1004.76	174.07			5.87	7.08		
Wall - East Rm 114	27,4	1.61	3.12			-0.83	1.51	606.02	187.48			-6.89	4.19		
Structure - Trusses Rm 114 NW	St-1	1.68	3.25			-0.83	1.51	-315.27	183.36			0.76	6.09		
Structure - Trusses Rm114 Center	St-2	0.42	3.00			-0.83	1.51	-26.72	189.57			10.96	7.94		
Structure - Trusses Rm114 SE	St-3	2.94	3.49			-0.83	1.51	-10.69	189.90			3.31	6.60		
Structure - Beams Rm 114 North	Sb-1	6.72	4.11			-0.83	1.51	-146.95	187.01			0.76	6.09		
Structure - Beams Rm 114 Center	Sb-2	4.20	3.71			-0.83	1.51	-34.73	189.40			-4.34	4.91		
Structure - Beams Rm 114 South	Sb-3	11.76	4.82			-0.83	1.51	77.48	191.76			-4.34	4.91		
Maximum:		11.76	4.82			1.93	3.14	1104.58	209.67			10.96	7.94	16.21	0.27
Minimum:		-3.18	1.99			-0.83	1.51	-421.86	152.45			-6.89	4.19	13.63	0.25
Average:		1.91	3.23			-0.43	1.74	269.40	186.41			1.84	6.23	14.67	0.26

BUILDING 064 - FINAL SURVEY CALCULATED RESULTS FOR LOT 3

				ALPHA						BETA				GAMMA	
SAMPLE	GRID			(DPM/100CM2)						(DPM/100CM2)				(uR/h)	
NAME	NAME	TOTAL	STD DEV	MAX	STD DEV	REM	STD DEV	TOTAL	STD DEV	MAX	STD DEV	REM	STD DEV	TOTAL	STD DEV
Floors - Rm 116	F-1	4.20	3.71			-0.83	1.51	1247.73	214.83			10.96	7.94	17.32	0.28
Floors - Rm 116	F-2	53.33	8.70			-0.83	1.51	1207.65	214.08			10.96	7.94	13.30	0.25
Ceiling - Rm 116	C-1	-0.84	2.72			1.93	3.14	117.56	192.59			-1.79	5.53		
Wall - West Rm 116	2,2	-0.84	2.72			4.68	4.17	887.04	207.99			5.87	7.08		
Wall - North Rm 116	5,1	0.42	3.00			-0.83	1.51	1191.62	213.78			-4.34	4.91		
Wall - East Rm 116	7,3	1.68	3.25			-0.83	1.51	782.84	205.97			3.31	6.60		
Wall - South Rm 116	10,2	4.20	3.71			-0.83	1.51	229.77	194.91			0.76	6.09		
Floors - Rm 120	3,1	7.02	3.98			-0.83	1.51	743.97	194.38			-1.79	5.53	13.24	0.25
Floors - Rm 120	4,3	9.50	4.35			-0.83	1.51	539.35	190.35			-1.79	5.53	11.23	0.23
Floors - Rm 120	7,3	28.08	6.48			-0.83	1.51	546.92	190.50			0.76	6.09	11.14	0.23
Floors - Rm 120	8,1	45.42	7.96			-0.83	1.51	599.97	191.55			3.31	6.60	9.48	0.21
Ceiling - Rm 120	1,4	3.30	3.35			-0.83	1.51	-271.57	173.46			0.76	6.09		
Ceiling - Rm 120	3,1	3.30	3.35			-0.83	1.51	-13.89	179.00			-1.79	5.53		
Wall - West Rm 120	1,2	2.06	3.12			-0.83	1.51	-423.14	170.11			8.42	7.52		
Wall - West Rm 120	4,3	5.78	3.78			1.93	3.14	-301.88	172.79			3.31	6.60		
Wall - East Rm 120	9,1	0.83	2.86			-0.83	1.51	16.42	179.64			-1.79	5.53		
Wall - East Rm 120	12,2	0.83	2.86			-0.83	1.51	-362.51	171.46			26.27	10.10		
Wall - South Rm 120	14,1	-1.65	2.26			-0.83	1.51	-612.61	165.84			-1.79	5.53		
Floors - Restroom	F-1	13.21	4.85			-0.83	1.51	569.66	190.95			10.96	7.94	10.23	0.22
Ceiling - Restroom	C-1	-0.41	2.58			-0.83	1.51	-377.67	171.12			3.31	6.60		
Wall - West Restroom	3,2	11.97	4.69			-0.83	1.51	-210.94	174.77			-4.34	4.91		
Wall - North Restroom	5,2	35.51	7.15			-0.83	1.51	289.25	185.30			-1.79	5.53		
Wall - East Restroom	7,1	-0.41	2.58			-0.83	1.51	8.84	179.48			8.42	7.52		
Maximum:		53.33	8.70			4.68	4.17	1247.73	214.83			26.27	10.10	17.32	0.28
Minimum:		-1.65	2.26			-0.83	1.51	-612.61	165.84			-4.34	4.91	9.48	0.21
Average:		9.85	4.09			-0.35	1.76	278.45	188.04			3.31	6.49	12.28	0.24

T64L3DAT.WB1

Gamma exposure rate in Bldg. 445

counts/1 min	uR/hr	uncertainty
3205	14.91	0.26
3189	14.83	0.26
3362	15.64	0.27
3366	15.66	0.27
3149	14.65	0.26
3194	14.86	0.26
3187	14.82	0.26
3109	14.46	0.26
3261	15.17	0.27
3365	15.65	0.27
3150	14.65	0.26
3181	14.80	0.26
3183	14.80	0.26
3237	15.06	0.26
3252	15.13	0.27
3380	15.72	0.27
3179	14.79	0.26
3231	15.03	0.26
3264	15.18	0.27
3242	15.08	0.26
3322	15.45	0.27
3274	15.23	0.27
3263	15.18	0.27
3191	14.84	0.26
3336	15.52	0.27
3228	15.01	0.26
3275	15.23	0.27
3174	14.76	0.26
3209	14.93	0.26
3212	14.94	0.26
3162	14.71	0.26
3264	15.18	0.27
3144	14.62	0.26
2794	13.00	0.25
3332	15.50	0.27
3277	15.24	0.27
3219	14.97	0.26
3376	15.70	0.27
3191	14.84	0.26
3049	14.18	0.26

BUILDING 064 - FINAL SURVEY CALCULATED DAILY INSTRUMENT BACKGROUNDS

	Instrument Background Qualification Data				
DATE	BKGD-A	EFACT-A	BKGD-B	EFACT-B	
	AVE for 5 min		AVE for 5 min		
07-Sep-93	2.563	4.407	279.759	7.705	ave plex
08-Sep-93	2.563	4.407	279.759	7.705	ave plex
09-Sep-93	2.563	4.407	279.759	7.705	ave plex
10-Sep-93	2.563	4.407	279.759	7.705	ave plex
14-Sep-93	2.167	4.445	272.333	7.648	
15-Sep-93	2.000	4.459	268.833	7.742	
16-Sep-93	2.563	4.407	274.833	7.995	
17-Sep-93	3.167	4.394	293.167	7.775	
20-Sep-93	2.167	4.379	278.333	7.421	
21-Sep-93	2.667	4.290	287.833	7.808	
22-Sep-93	3.333	4.434	281.333	7.358	
23-Sep-93	2.667	4.467	281.333	8.015	
24-Sep-93	2.333	4.393	279.833	7.579	
ave plex	0.513	4.407	55.952	7.705	

Energy Technology Engineering Center — DOCUMENT CHANGE RECORD

LEDGER	G.O.	SUBACCT.	No
29841	53596	87507	16097

DOC NO. 7593-EL250113 | REV. G | PROJECT: SCTF

PROCEED IMMEDIATELY ☐ YES ☒ NO

SDD CHANGE REQUIRED ☐ YES ☒ NO

ACTION BY: CONST. ☐ TEST ☒ OTHER ____

AGREED BY: [signature]

ACTION COMPLETE

SDD CHG BY:

PROGRAM MGR. [signature]

REQUESTER R.S. Homer

ORIGINATOR R.S. Homer

MGR TECH DOC ORIG [signature] 2-10-94

CHECKER RK Nakata 10-19-93

FAC. PROJ. ENGR. [signature] 2-10-94

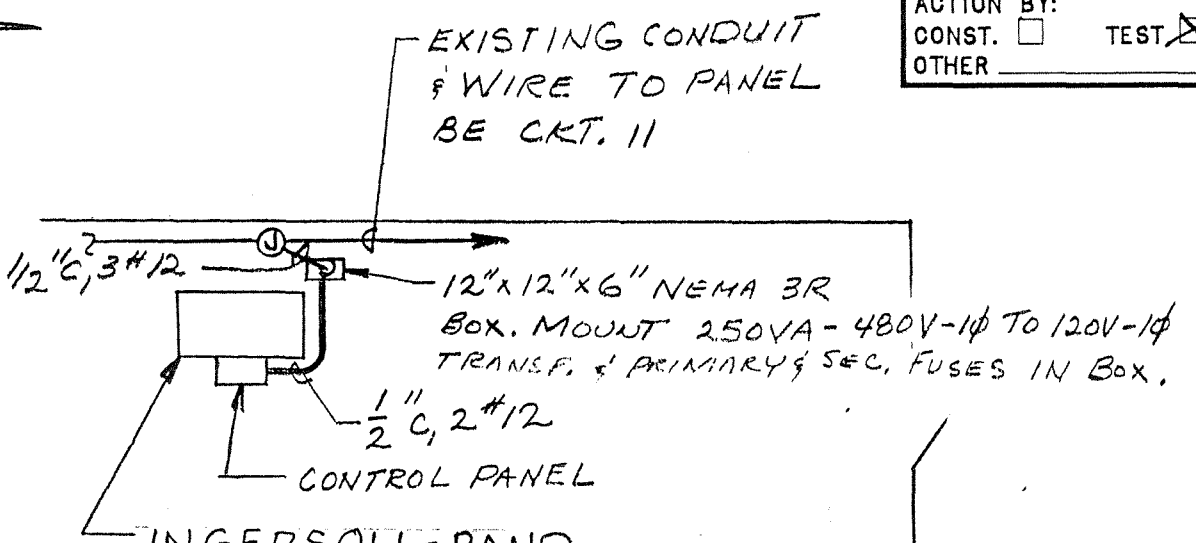
QUALITY ENGR. [signature] 2-10-94

LEVEL 1 APPROVAL

ASU DATA CLERK

SPECIFIC CHANGE REQUIRED:

— N —



TEST STAND 1

REASON FOR CHANGE:

NEW AIR DRYER

OTHER DOCUMENTS CHANGED BY THIS DCR:

355-ED-250

FORM 735-A-75 REV.7-84

DATE: 8-19-96

D/092 INCOMING

ENVIRONMENTAL

ACTION ASSIGNED TO:

ADDRESSEE: P. Rutherford

|ACTION A&R DUE:

✓ |INFORMATION

|ADV COPY | |W/ENC.

|ALL WITH ENCLOSURES

NUMBER:

07284 RC

		letter	encl
ALBAUGH J.F.	AA45		
ABRAMSKI J.G.	PA45		
ACCTS/PAYABLE	NB16		
ASSARIAN T.	PA45		
BARNES J.G.	T100	1	
BASSAT I.B.	T034		
BLANDINO P.	SS14		
BODEMEIJER R.	AC69		
BOEHME P.R.	T038		
BRADLEY J.W.	AA52		
CHUNG D.	PA45		
CIRLCE L.A.	AB57		
COSTA P.J.	PA45		
DAHL F.C.	T100	1	
DOSIMETERY FILE	T100		
DCMC	PA14		
DUNCAN R.D.	T100		
EDSTROM J.C.	T100		
FALTEMEIR S.	AA47		
GABLER M.J.	T038		
GAY R.L.	T006		
GAYLORD G.G.	AA24	1	
GERRITSEN W.J.	T355		
GOUDREAULT A.R.	CA08		
HANNA R.	PA45		
HARD P.S.	PA45		
HARDY R.B.	T038		
HARTE J. 001	B28		
HARTMANN R.	CA08		
HICKMAN D.W.	T100		
HIMMONS W.	SS25		
Hardy R.B.	T038	1	
HORTON P.H.	T038	1	
HORWATT J.V. 001	C12		
KLEIN J.A.	IA48		
LAFFLAM S.R.	AA24	1	
LE CHEVLAIER R.	T038		
LEE M.E.	T038	1	
LEENEY B.C.	SS14		
LENOX A.J.	SS14		
LEWIS R. 114	PF21		
LIDDLE R.	T038		
LUTHER W.J.	AB61		
MASTER FILE	AA01		
MATTERA N.L.	PA45		
MC COURT P.E.	IB71		
MC GINNIS E.R.	T100	1	
MC ILVAINE W.D.	PA45		
MEYER R.D.	T038		
MONTGOMERY G.	PA45		
MOORE R.M.	T038		
MUKHERJEE N.	SS14		
NELSON A.D.	SS14		
OLIVER B.M.	T100	1	
O'ROURKE K.	PA45		
PRITCHETT D.	T100		
REEDER S.	T038		
REISENWEBER 001	D58		
ROBERSON O.	PA13		
ROBERTSON M.	SS21		
RODMAN L.E.	PA50		
RUTHERFORD P.D.	SS14	1	
SCOTT D.M.	CA08		
SEAMANS R. 001	B35		
SECURITY	AA89		
SHERER R.S.	PA50		
SHERMAN J.M.	SS14		
SHESTAG S.L.	SS14		
SHIROMA P.	PA50		
SINDERMAN K.D.	T100		
SKOLNICK M.L.	AA07		
SMITH M.L.	EA08		
SMITH P.B.	AA49		
SPENCER D.	T038		
SUBBARAMAN G.	T009		
SUJATA B.D.	SS14		
SULLIVAN M.J.	SS14		
SWANSON F.	PA45		
TAVASOLI K.	SS14		
TAYLOR C.W.	PA45		
TEWELDE L.	PA45		
TRIPPEDA D.M.	T020		
TUTTLE R.J.	T100	1	
UESHIRO R.Y.	SS14		
USER AUTH.	T100		
VENABLE T.	PA45		
VETTER W. 001	B28		
WALLACE J.H.	T100		
WOOD B.K.	AA40		

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REVISED 8-29-96

(11) KC 9-5-96

With Enclosure

* Distrubution in Advance

INENVIR

**Our e-mail address is listed as Corrspondence in the Global Address List

STATE OF CALIFORNIA—HEALTH AND WELFARE AGENCY PETE WILSON, Governor

DEPARTMENT OF HEALTH SERVICES
714/744 P STREET
P.O. BOX 942732
SACRAMENTO, CA 94234-7320

(916) 323-2759

August 19, 1996

Mr. Phil Rutherford, Manager
Environmental Remediation
Rocketdyne Division
Rockwell International Corporation
P. O. Box 7930
Canoga Park, CA 91309-7930

Subject: Demolition and Disposal of Structural Material from Building T064 at SSFL

Dear Mr. Rutherford:

This letter is to acknowledge the receipt of your letter dated July 30, 1996, with attachments, requesting concurrence of the above subject. Based on the review of your submittal and the results of the surveys performed by the inspection staff of our Los Angeles office, the Radiologic Health Branch (RHB) concurs that you may proceed with the demolition of the Building T064 and that you also may dispose of the structural material resulting from such demolition as conventional waste.

If you have any questions concerning this matter, please feel free to call Mr. Stephen Hsu of this office at (916) 322-4797.

Sincerely,

Gerard Wong, Ph.D., Chief
Radioactive Material Licensing Section
Radiologic Health Branch

007284 RC

Oliver, Brian M.

From: Gerard Wong
To: bmoliver@rocket.rdyne.rockwell.com
Subject: T064 Building Debris Disposal
Date: Thursday, August 22, 1996 3:47PM

*** Reply to note of 08/21/96 16:06
We sent you a letter dated 8/19/96 concurring to the disposal of materials as a result from demolition of Bldg T064.

ETEC LETTER REVIEW RECORD

LTR.No.: 96 ETEC-DRF- 0413 File Name:_____ Disk No.:_____ Date: 07-30-96

Subject: Demolition and Disposal of Structural Material from Building T064 at SSFL

Addressee: G. Wong Signed by: P. D. Rutherford

Prepared by: B. Oliver Typed by: B. Oliver

Related G.O. No.:_____ Completes Action in: DRF-_____ Req. Action by: ETEC _____ Other _____ None _____

Remarks:

Approvals-

_Director & Program Mgr :_____
_Director Operations:_____
_Mgr. Gen. Programs:_____
_Mgr. Fac. Support:_____
_Mrg. EM Pump:_____
_Mgr., Business Mgmt:_____
XPgm. Mgr. Env Mgmt: [signature]
_Mgr. Env.Mgmt:_____
_Mgr. PPTF:_____
_Mgr. Progess Dev.:_____
- Mgr Env Rem POR

- Distribution -

Without Enclosure (/)						With Enclosure (X)	
_Akamine, K. S.	T039	_Heslin, S. R.	T038	_Reeder, S. E.	T019	/ Barnes	T100
_Albert. A.	T019	_Hodge, S. E.	T019	_Rochelle, D. R.	T039		
_Alpert, E. E.	T038	_Homer, R. S.	T039	_Ruffino, K.	T038		
_Amar, R. C.	T038	_Horton, P. H.	T038	_Roy, J. J.	T006		
_Ampaya, J. P.	T006	_Ingersoll, R. D.	T038	_Ruffino, K.	T038		
_Atkinson, R. F.	T334	_Jaquay, K. R.	T013	/ Rutherford, P. D.	T436		
_Aubuchon, D. F.	T355	_Jassak, R. M.	T013	_Sahagian, D. H.	T038		
_Bassat, I. B.	T034	_Jetter, R. I.	T038	_Samuels, S. L.	T038		
_Beamer, S. K.	T038	_Kneff, D. W.	T038	_Santa Ines, R.	T039		
_Berreth, J. M.	T039	_Knudsen, K. T.	T038	_Schmidt, T. E.	T462		
_Berwager, L. E.	T462	_Kramer, S.	T038	_Sena, D. B.	T006		
_Blandino, P.	SS14	_Lafflam, S. R.	AA24	_Shah, S.	T038		
_Boggio, J. M.	T462	_Langowski, T. J.	T039	_Sinclair, R. M.	T355		
_Chen, W. P.	T038	_Larson, D. A.	TO13	_Stellman, D.	T006		
_Cleveland, J. R.	T355	/ Lee, M. E.	T038	_Stone, L. R.	T038		
_Darley, D. K.	T462	_Limlamai, M.	T038	_Subbaraman, G.	T038		
_DeBear, W. S.	T038	_Makuta, R. K.	T039	_Sujata, B.	T038		
_Doerr, S. M.	T039	_Marshall, R. A.	T034	_Tapia, D. G.	T355		
_Ervin III, G.	T038	_McDowell, M. W.	T038	_Trippeda, D. M.	T020		
_Finch, M.	T038	_Meyer, R. D.	T038	_Ueshiro, R. L.	T436		
_Fuentes, G. L.	T133	_Moore, R. M.	T038	_VandenHeuvel, R.	T038		
_Fusselman, S.P.	T006	_Murkherjee, N.	SS14	_VanLeeuwen, R.	T334		
_Gabler, M.	T038	_Newcomb, J. C.	T006	_Waite, P.	T059		
_Gay, R. L.	T006	_Ohara, P. S.	T038	_Wells, T. L.	T013		
_Gaylord, G. G.	AA24	/ Oliver, B	T100	_A/C Coordinator	T038		
_Gerritsen, W. J.	T355	_Olson, P.	T038	X DRF Control *	T038		
_Green, P. M.	T038	_Onesto, A. T.	T013	_Library	T038		
_Grimmett, D. L.	T006	_Pascolla, A. L.	T038	/ Elstrom	T100		
_Guon, J.	T006	_Peterson, E. V.	T038	/ Tuttle	T100		
_Hardy, R.	T038						

Form 735-A-174, Rev. 04-96

Energy Technology Engineering Center
Rocketdyne Division
Rockwell International Corporation
PO Box 7930
Canoga Park, CA 91309-7930
818.586.5326
Operator for U.S. Department of Energy

Rockwell Aerospace
Rocketdyne

July 30, 1996

In reply refer to 96ETEC-DRF-0413

Dr. Gerard Wong
Radiologic Health Branch
Radioactive Materials Licensing
State of California Department of Health Services
601 N. 7th Street
P.O. Box 942732
Sacramento, CA 94234

Subject: Demolition and Disposal of Structural Material from Building T064 at SSFL

Reference: "Final Radiological Report of Building 064 Interior", ETEC Document SSWA-ZR-0001, January 1994.

Dear Dr. Wong:

As you may be aware, DOE has given approval for the release and demolition of Building T064 at the Santa Susana Field Laboratories (SSFL) in FY97 (Enclosure A). The remaining land is to be combined with the T064 Sideyard into one site for subsequent completion of remediation efforts and eventual release.

Building T064 was surveyed by Rocketdyne in 1993 and the results reported in 1994 (Reference). The results of that survey indicated that the building met all of the requirements of the DOE, the NRC, and the State of California for release without radiological restriction. An independent verification survey of T064 was subsequently conducted by the Oak Ridge Institute for Science and Education (ORISE) and the State in July 1994. One small area was identified by ORISE with contamination above guideline levels, and this area was remediated by Rocketdyne/ETEC personnel to below guideline levels. Subsequent to this remediation, ORISE agreed that T064 met DOE requirements for unrestricted release (Enclosure B). The State has also verbally concurred with the results of these surveys.

Based on the above surveys and releases, it is our understanding that the materials from the demolition of this building may be disposed of as conventional waste. As we are currently in the planning stages for this demolition, we would appreciate it if you would advise us as soon as possible if this understanding is correct.

Should you have any questions, or require additional information, please contact the undersigned at (818) 586-6140 or at pdruther@rdyne.rockwell.com.

Very Truly Yours

Phil Rutherford, Manager
Environmental Remediation

Enclosures:

A. "Demolition of Building 064", DOE-Oakland Letter dated June 25, 1996, M. Lopez to M. Lee (enclosed).

B. "Verification Survey of Buildings 005, 023, and 064, Santa Susana Field Laboratories, Rockwell International, Ventura County, California", ORISE Report 94/K-14, October 1994.

cc without enclosure

M. E. Lopez DOE-OAK

Oliver, Brian M.

From: Rutherford, Philip D.
To: Lee, Majelle E.; Oliver, Brian M.; Horton, Philip H.; Hardy, Robert B.; Tuttle, Robert J.
Subject: RE: 4064
Date: Friday, July 26, 1996 10:25AM

As we discussed on Friday, both ORISE and the State have surveyed the 064 building. ORISE have documented as clean. State has verbally said it is clean but have not documented this in a letter (to my knowledge). DOE approved demoliton in June by letter. We will discuss disposal of above ground 064 rubble as clean waste to landfill with the State next week when they are here and solicit their written concurrence. We will however have to survey/sample under the concrete foundation and drain pipes.

From: Hardy, Robert B.
To: Rutherford, Philip D.
Cc: Tuttle, Robert J.; Oliver, Brian M.; Lee, Majelle E.; Horton, Philip H.
Subject: 4064
Date: Thursday, July 25, 1996 2:13PM
Priority: High

Phil,

You are probably aware that building 4064 is currently scheduled to be demolished in FY 97. The understanding that I have is that the building has been free released by ORISE and DHS. If this is true, can the building be rubbleized and disposed of as clean waste? I am currently working on a SOW to demolish this building by a excavator (Big Back Hoe) and break up all the concrete (with the exception of the floor and foundation which will be handled by D/022). The material will be haul it off the hill and disposed of as clean waste . It is necessary that we know all the road blocks, before we proceed with the SOW.

thanks
Bob

96ETEC-DRF0322

Department of Energy
Oakland Operations Office
1301 Clay Street, N700
Oakland, CA 94612-5208

June 25, 1996

Majelle Lee
Program Manager
Environmental Programs
Energy Technology Engineering Center
Rocketdyne Division
Rockwell International Corporation
P.O. Box 7930
Canoga Park, CA 91309-7930

Subject: Demolition of Building 064

Dear Ms. Lee:

The cleanup of radioactive decontamination at Building 064 is complete. ORISE has verified the condition of the building. Consequently, approval is given for the demolition of B064. The empty site (the land) will be combined with the B064 Sideyard into one release site. This release site is expected to be ready for a release for unrestricted use in FY97, after the remediation of the Sideyard is completed.

Sincerely,

Michael Lopez

Michael Lopez
ETEC PM
Environmental
Restoration Division

Date: 07-01-96
DRF No. 96ETEC-DRF-0322
Distribution List - Environmental Management

From: Department of Energy
To: Majelle Lee

- Distribution -

_Akamine, K. S.	T039	_Heslin, S. R.	T038	_Reeder, S. E.	T019
_Albert. A.	T019	_Hodge, S. E.	T019	_Rochelle, D. R.	T039
_Alpert, E. E.	T038	_Homer, R. S.	T039	_Ruffino, K.	T038
/Amar, R. C.	T038	/Horton, P. H.	T038	_Roy, J. J.	T006
_Ampaya, J. P.	T006	_Ingersoll, R. D	T038	_Ruffino, K.	T038
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_Beamer, S. K.	T038	_Knudsen, K. T.	T038	_Santa Ines, R.	T039
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_Finch, M.	T038	_McDowell, M. W.	T038	_Tapia, D. G.	T355
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_Fusselman, S.P.	T006	_Moore, R. M.	T038	_Ueshiro, R. L.	T436
/Gabler, M.	T038	_Murkherjee, N.	SS14	_VandenHeuvel, R.	T038
_Gay, R. L.	T006	_Newcomb, J. C.	T006	_VanLeeuwen, R.	T334
_Gaylord, G. G.	AA24	_Ohara, P. S.	T038	_Waite, P.	T059
_Gerritsen, W. J.	T355	/Oliver, B	T100	_Wells, T. L.	T013
_Green, P. M.	T038	_Olson, P.	T038	_A/C Coordinator	T038
_Grimmett, D. L.	T006	_Onesto, A. T.	T013	X DRF Control *	T038
_Guon, J.	T006	_Pascolla, A. L.	T038	_Library	T038
/Hardy, R.	T038	_Peterson, E. V.	T038		